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STEEL

The Magazine of Metalworking and Metalproducing

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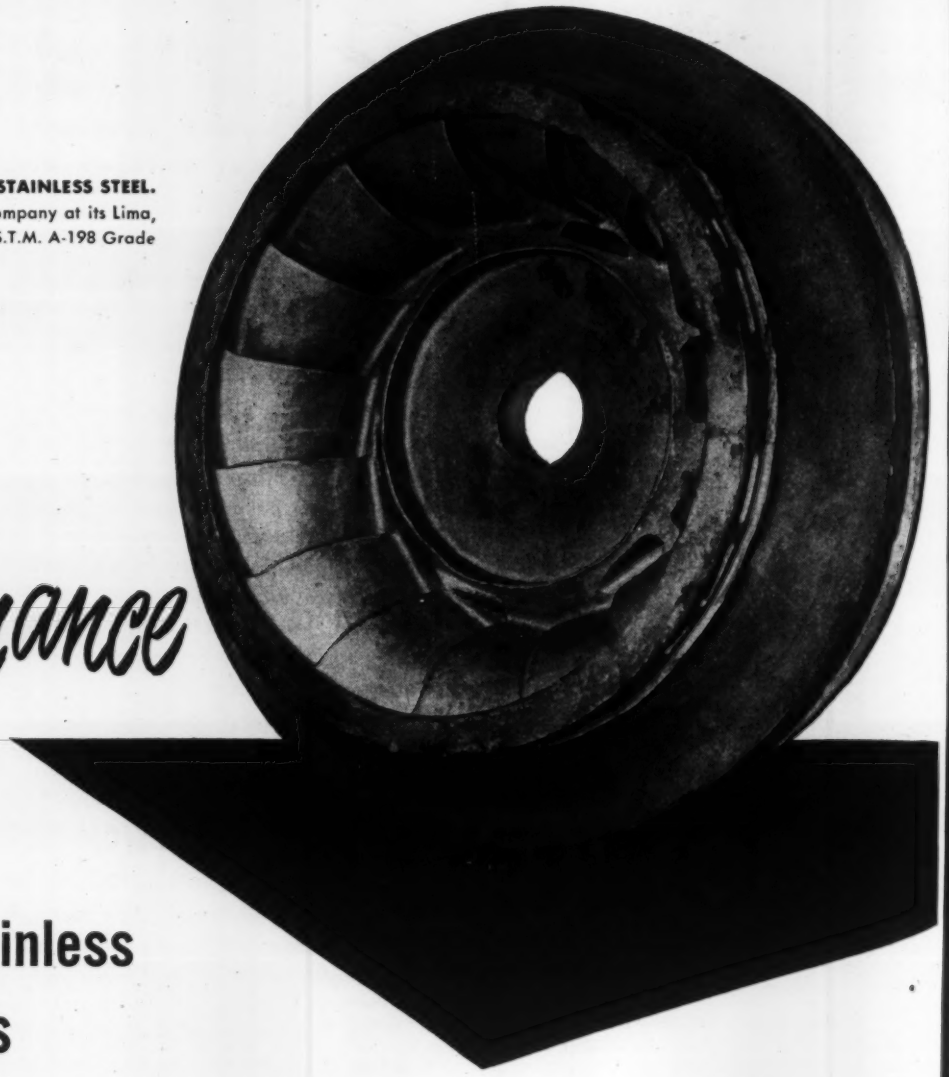
***Next Week*... Carbon Restoration Improves Wear Resistance ... Pratt & Whitney Draws Rapid Work Hardening Alloys to Close Limits ... Master Curves Simplify Tempering of Stainless Steels ... 500-Ton Basic Open Hearth Furnace Shows Operating Economies.**



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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

October 16, 1950

War Preventive

When North Koreans crossed the border into South Korea on June 27, they started a backfire that is making important history. Instead of condemning the aggression with idle words of protest, as did freedom-loving nations during the thirties, the United Nations called for decisive action. Spearheaded by armed forces of the United States, armies of several nations under the direction of General Douglas MacArthur stopped the invaders at the eleventh hour, gained the offensive, won a decisive victory south of 38 degree parallel and now are marching into North Korea to fulfill the objective of reuniting the north and south segments into a single, independent nation.

The prompt decision to resist aggression with force instead of appeasement has had repercussions extending far beyond the battlefields of Korea. The spark of firm resistance has kindled a flame of preparedness that is sweeping the world. Today the United States, as the nation most capable of adding fuel to this flame, is definitely committed to an extensive program of rearmament.

To what degree this commitment will interfere with peacetime pursuits remains to be determined. It is obvious that American industry must devote a substantial portion of its facilities to military requirements for an indefinite period. Industrial leaders are fully aware of this obligation and are months ahead of Washington officialdom in their appreciation of what needs to be done.

Such is the garrison-state economy confronted by the metalworking industry as the 32nd annual National Metal Congress & Exposition gets under way next week in Chicago. Appropriately the theme of the event is "high production in an emergency." Throughout the technical sessions of the sponsoring societies and in the hundreds of exhibits at the show, major emphasis will be placed upon techniques that can be employed effectively in mobilizing industry for military preparedness.

This emphasis is extremely important. If there is any one thing—beyond our initial military successes in Korea—that will deter the dictators in the Kremlin from launching World War III it is their respect for the enormous potential of American industry. In Chicago next week you will see evidences of the might of this war-preventive potential. Key your activities to its great promise for world peace!

* * *

RESEARCH IS POTENT: Imminence of the 1950 National Metal Congress & Exposition makes industrial research a timely subject. Relatively few persons fully appreciate how rapidly research has grown in recent decades or to what extent it is contributing to industrial expansion.

One measure of its growth is the number of research laboratories and the number of persons employed in laboratories. In 1920 there were 300 laboratories employing 9300 persons. In 1947 there were 2500 laboratories with 135,000 employees. It is estimated that by 1957 we will have 5000 laboratories employing 250,000 technicians.

That research really pays off no longer is questioned by any informed person. In 1942 E. I. du Pont de Nemours & Co. estimated that 46 per cent of its sales were of products created by research that did not exist as recently as 1928. Johns-Manville calculated recently that 56 per cent of its sales were research-created products that were non-existent in 1928. There are companies operating profitably 100 per cent on products discovered since 1930.

An important feature of research is that its

(OVER)

benefits are widely diffused. A major company, concentrating upon basic research, often develops a new product from which it benefits as a producer but from which hundreds of other companies benefit as processors, fabricators or distributors.

Research is one of the important elements in the potential of American industry—another hope for world peace. —p. 102

* * *

STEEL SUPPLY IN 1951: National Production Authority is trying to get a line on steel supply and needs over the short-term future. Assuming that production of finished rolled steel can be sustained at an annual rate of 75 million tons and that there will be no steel strike in January, NPA anticipates a progressive tightening in the first and second quarters of 1951 and possibly acute shortages in the last half.

For the first quarter of next year NPA foresees an output of 18,750,000 tons of finished steel of which 2 million tons will be required for military and freight car programs. In the second quarter, output will be the same or more, of which 2.5 million tons will be needed for military and freight car programs.

Beyond the first half, the outlook is not clear. Some new steelmaking capacity may be operative by then. However, a number of preparedness projects now in the "talk" stage, may require substantial tonnages of steel before the end of 1951. —p. 69

* * *

ONLY 13,000 ENGINEERS: Metalworking companies that normally employ a number of graduate engineers each year will confront an acute shortage of this type of trained personnel during the next several years.

American Society for Engineering Education has surveyed the enrollment in the nation's engineering schools and has found a situation which it describes as "alarming." This year's freshmen engineering enrollments total 26,500 which is 20 per cent below enrollments at the start of World War II. The 26,500 freshmen will dwindle to about 13,000 graduates in 1954. This is less than half of the normal peacetime number required to meet industrial and other demands.

At one time it was feared that many of last year's record-breaking graduating class of 50,000 would have difficulty finding jobs. All have been absorbed and the government now lists all branches of the engineering profession as critical occupations. —p. 71

* * *

SEEK UNDERSTANDING: Members of the National Machine Tool Builders' Association in annual convention in Toronto last week were concerned about the type of treatment the machine tool industry will receive from government authorities and from suppliers of materials during the coming months. Most builders are loaded with business consisting chiefly of civilian orders precipitated by the Korean war. Their big problem now is: How to handle the defense business, which inevitably will come, on top of this present civilian volume?

Builders are confident they can meet the challenge if they get intelligent treatment by Washington officialdom. They believe this treatment will be forthcoming if the planners of industrial mobilization can be made aware of the strategic position of machine tool builders in a garrison-state economy. Solution of the industry's major problems—material supply, manpower, fair renegotiation policies, amortization, etc.—depends largely upon the extent to which Washington really understands the vital role of machines in preparedness.

The nation faced this same problem in World Wars I and II. We should profit from past experience to do a better job now. —p. 72

* * *

NEW PLATING PROCESS: Chromium plating applications have become so widespread in today's industrial setup that any marked improvement in technique adds up to important economies quickly and appreciably. After remaining more or less static for nearly two decades, chromium plating techniques now are feeling the impact of a new development that cuts plating time from 20 to 80 per cent and ups cathode efficiencies 20 to 50 per cent.

The agent for this improvement is a self-regulating high speed chromium bath (SRHS) which about 350 plants have adopted to date. It steps up plating production on existing equipment with a power saving as high as 30 per cent. Among the first companies to cash in on the advantages of the new process are automotive parts and builders' hardware manufacturers. Its possibilities are well worth investigation. —p. 98

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

THE PICTURE IN STEEL—Steel supply prospects look bleak (p. 69). National Production Authority foresees a slight easing this quarter, but after the first of 1951 it expects steel shortages to get steadily worse. As of next June 30, counting priority and allocation orders now in sight and figuring conservatively on an annual production rate of 75 million tons of finished products, priority and allocation requirements will be taking 13 or 14 per cent of the steel supply. That's not as bad as it looks, because military and freight car programs already are taking 3 or 4 per cent of the available steel . . . The steel industry produced an alltime high of 71,608,358 tons of ingots in the first nine months of 1950 (p. 70).

CLARIFICATION—NPA Order M-1 seeks to minimize disruptions caused by NPA Regulation 2 regarding priorities. It provides for lead time in steel mill scheduling by permitting steel producers to reject rated orders received less than 45 days before the first day of the month in which shipment is requested. No steel producer shall be forced to accept DO (Defense Order) rated orders for a total tonnage of all products in excess of 15 per cent in the case of carbon steel and 25 per cent in the case of alloy steel of his scheduled production of ingots in any one month (p. 70).

PRICE OF STEEL—Steel prices will go up if the steelworkers get the wage boost they're now angling for (p. 70). The CIO won't catch as big a fish as it says it wants—a 25-cent boost across the board—but odds are that it will land more than the 10-cent increase obtained by workers in auto and other industries. If wages go up 10 per cent, prices may rise 5 per cent or about $5 a ton.

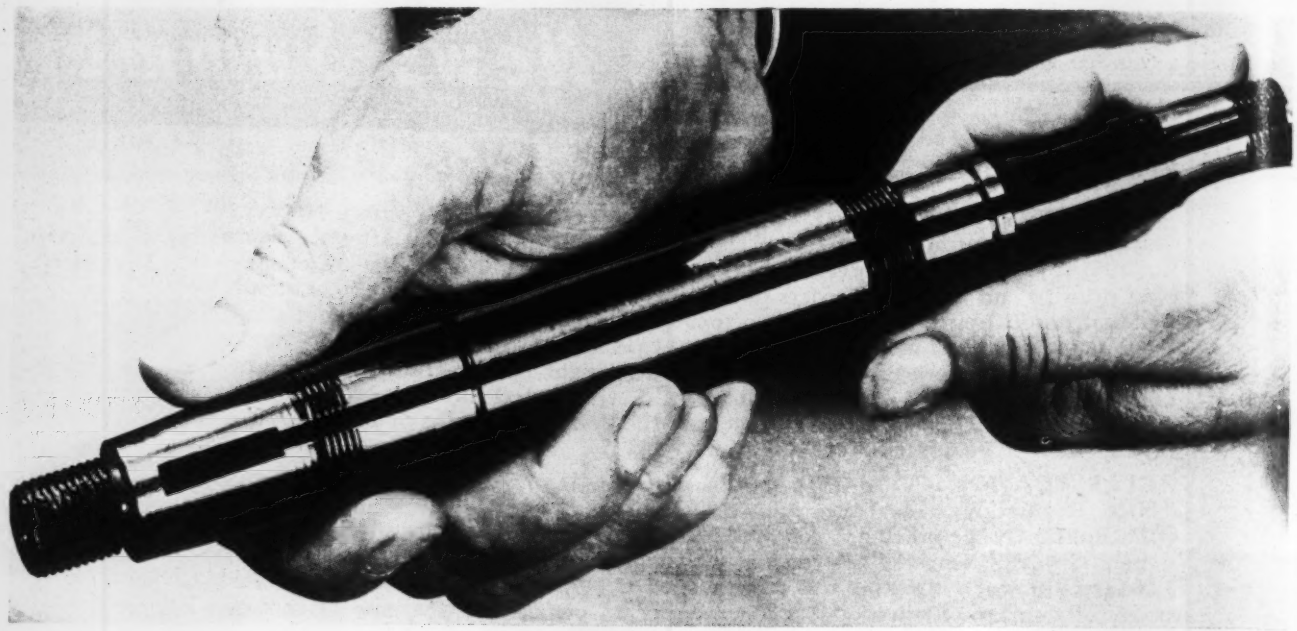
HOLD THAT LINE—The price line is bulging in nearly every direction. STEEL's nonferrous index rose to 223.1 from 218.3 in the prior week (p. 87). The index for all metals and metal products is up to 177.1 from 176.4 the previous week. Independent automakers are already boosting prices, and the Big Three must soon follow, probably with increases averaging about $50 on 1951 models (p. 83). Despite the problem of prices and materials supplies, industrial production keeps rolling (pp. 86-89). STEEL's industrial production index is at 219, compared with 121 a year ago and 184 two years ago. Appliance sales are high. Tool and die shops have the highest order backlogs since May, 1947.

WHAT KIND OF BUSINESS?—Machine tool builders point out that nearly all their current sensationally high volume is civilian work, although precipitated by the Korean war (p. 72). The machine tool problem is: How to handle the defense business, certain to come, on top of civilian volume ? Speakers at an industry meeting said that part of the answer lies in an intelligent approach to Washington to get wise treatment by the government in allocations, renegotiation and taxes.

INSURANCE IN RESEARCH—General Electric Co. has just opened an $18 million research center near Schenectady, N. Y. (p. 73). GE President Charles E. Wilson says that one important way big companies can serve the public is through such projects because research has become so complicated and costly that only large firms and government can afford to do a lot of it.

INFLATION IN EUROPE—Inflation threatens in Europe, but it has not yet reached the proportions of the U. S. spiral (p. 79). One ominous price rise abroad is on export steel. Rearmament is bound to affect the whole economic structure, and the Organization for European Economic Cooperation is now studying the matter.

HERE AND THERE IN INDUSTRY—Allis-Chalmers Rumley Ltd., a Canadian subsidiary of Allis-Chalmers Mfg. Co., has bought a plant at St. Thomas, Ont., (p. 74) . . . Metalworking is participating in Treasury's new savings bond drive (p. 80) . . . Doehler-Jarvis Corp. is continuing a Toledo, O., expansion plan (p. 81) . . . Armco Steel Corp. will open its new open-hearth plant in Middletown, O., Oct. 16.



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SHEETS—Hot & cold rolled, many types & coatings
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ALLOYS—Hot rolled, cold finished, heat treated
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
TOOL STEEL—Oil and water-hardening
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MACHINERY & TOOLS—For metal fabrication

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STEEL
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Steel Supplies in 1951: Tighter

NPA believes steel will be a little easier to get this quarter, progressively tighter in the first and second quarters next year and acutely short in the second half

THE PICTURE now unfolding before the National Production Authority promises a slight easing of the steel supply this quarter, progressive tightening in the first and second quarters of next year and acute shortages in the second half of 1951.

That outlook is based on sustained production of finished rolled steel at an annual rate of 75 million net tons or a little better—and, no steel strike in January.

Pessimistic—This breakdown is by quarters and shows how priority ratings and voluntary or mandatory allocations will cut into the nation's steel supply:

Last quarter, 1950: Finished steel production, 18,750,000 tons. Priority requirements for military, including foreign arms aid, 765,000 tons. Because priority tonnage is smaller than expected, most mills will ship more steel to civilian consumers than they had promised.

First quarter, 1951: Finished steel production, 18,750,000 tons. Priority requirements, including 1,250,000 tons for military and 750,000 tons for construction and repair of freight cars, or a total of 2 million tons. Of this total about 925,000 tons will be in addition to the steel now going, with and without priorities and allocations, for those purposes.

Second quarter, 1951: Finished steel production, 18,750,000 tons (or more). Priority and allocations requirements, including 1,750,000 tons for the military and 750,000 tons for the freight car program, or a total of 2.5 million tons. Of this total about 1,425,000 tons will be in addition to the steel going for those purposes in the fourth quarter of 1950.

Optimistic—NPA expects steel ingot capacity to be larger by the end of 1952 than the 109,963,000 tons announced by Commerce Secretary Charles Sawyer. Prospects are good that some of that capacity will be in by the second quarter next year; hence, finished steel production may exceed 18,750,000 tons conservatively estimated for the period. The Sawyer ingot figure is based on reports from a limited number of leading producers. Other producers, known to have expansion programs, haven't yet reported. Others that have reported may be expanding even more. Youngstown Sheet & Tube Co., for example, is engineering its East Chicago, Ind., expansion so that more facilities than will be built immediately can be eventually installed quickly and economically.

As of June 30, 1951, counting the priority and allocation orders now in sight, and figuring conservatively on an annual production rate of 75 million tons of finished products, priority and allocation requirements will be taking between 13 and 14 per cent of the steel supply. But the situation will not be as tight as that percentage figure indicates. Allowing for the fact that steel now is going into military programs and freight car construction and repair at the rate of 2,000,000 tons annually, the increased load for these purposes comes to 8 million tons or 10.6 per cent.

Not Enough—No figures for individual products are available but it is known that sheets and strip and plates predominate in the program. There will not be enough of these products to go round in the second quarter.

For the second half of next year the outlook is grim because many programs are brewing. That period will have a carryover of at least 4 million tons of steel to carry out military contracts covered by the $30 billion appropriation for fiscal 1951, not counting work that will be started from 1952 appropriations. And the freight car program in the second half will take 1.5 million tons.

Programs Pending — Other programs now in the "talk" stage call for construction of fast oil tankers and dry cargo ships, a fleet of inland waterway barges, gas pipelines to New England and the West Coast, a number of lake ore carriers, about $2 billion of power plant and other construction, extensive expansion of mining operations. Washington expects that steel requirements for military and other essential uses will be taking 20 to 25 per cent of the total supply by Dec. 31, 1951—unless Congress calls for a slower tempo in military preparedness.

NPA knows a big job is ahead, but it believes it has ample time to prepare its moves as the situation tightens. Use-limitation orders, especially of alloy steels; conservation orders; a warehouse order and other orders are being prepared but will not be made effective now. The first two orders issued—inventory control and priority—will be amended. For example, the priority order already has been clarified to permit rerolling mills to use priority ratings in ob-

ROOM FOR EXPANSION: At this site near the Indiana Harbor plant of Youngstown Sheet & Tube Co. at East Chicago, Ind., there is room for a 12-furnace open hearth. Thus far, though, the company's directors have authorized only four furnaces. They have not yet disclosed what additional finishing mills will be built

taining rerolling rails. Ferrous scrap will be deleted from the inventory order, and consumers will be allowed 60 days' stock of steel and 30 days' stock of pig iron.

Plan the Planning—David B. Carson has been appointed director of the NPA Iron & Steel Division. Mr. Carson has been granted leave of absence as sales vice president of Sharon Steel Corp. and will serve NPA on a "loan" basis. He'll remain on the Sharon payroll and serve government without compensation. The job of division head may be on a rotating basis.

Serving in the steel task group with Mr. Carson are Melvin W. Cole, Bethlehem Steel Co.; Norman W. Foy, Republic Steel Corp.; and Richard F. Sentner, U. S. Steel Corp. A new man from that group may come in as director every two or three months to give each man a chance to get back to his job. The draft from industry has started in others ways, too. H. L. Leyda, General Steel Co., Fort Worth, Tex., has joined the division's New Facilities staff.

Additional industry advisory committees now being organized in the NPA setup will represent the freight carbuilding, automobile, steel warehouse and machine tool industries. More will come later.

DAVID B. CARSON
Director, NPA Iron & Steel

Steel Mills Get Ceiling Limits on Defense Orders

NATIONAL PRODUCTION Authority Order M-1 establishes specific rules for the placing, accepting and scheduling of orders for various steel products that have been assigned a DO (Defense Order) priority rating.

Administrator William H. Harrison says: "Its purpose is to maintain maximum steel output and to reduce possible disruption of distribution to other steel users by providing for economic scheduling and equitable distribution of the DO rated orders among all steel producers." It provides for lead time in mill scheduling by permitting steel producers to reject rated orders received less than 45 days before the first day of the month in which shipment is requested. It also sets a ceiling for acceptance of priority orders. The ceiling is based on both product and total tonnage. Under the latter provision no steel producer need accept DO orders for shipment in any one month in excess of specified percentages of his average monthly shipments during the first eight months of 1950.

What's the Percentage?—The percentages are: 5 per cent for carbon semifinished steel, carbon and alloy sheets and strip, carbon pipe, tin mill products, rail and track accessories, carbon wire rods, wire and wire products; 10 per cent for carbon hot-rolled and cold-finished bars and carbon tubing; 15 per cent for carbon and alloy plates and structural shapes and piling, and alloy cold-finished bars; 25 per cent for alloy semifinished steel and hot-rolled bars, alloy tubing, and alloy wire rods and wire.

No steel producer shall be required to accept DO rated orders for a total tonnage of all products in excess of 15 per cent in the case of carbon steel and 25 per cent in the case of alloy steel of his scheduled production of ingots in any one month. These percentages are expected to be adequate to meet defense procurement requirements for the time being but are subject to immediate change as requirements of the defense program increase.

One of the tasks of the NPA Iron & Steel Division will be to assist in locating other steel mill sources when a DO order cannot be placed because of the ceiling limitations established by the new order. Similar orders for copper and rubber are now being prepared.

Inland Battles Gray Market

Inland Steel Co. is asking its customers to report to it any deals in which its steel is offered in gray market transactions.

"Tall tales" persist, says Vice President Joseph L. Block, of "fantastic" tonnages of steel being offered, sometimes naming Inland as the supplier. "All such stories are completely false," he says.

Customers received with Mr. Block's letter copies of an earlier letter dated Apr. 28, 1948, which reminded steel users: "All transactions are made with the understanding that manufacturers are purchasing the products for their own use . . ."

Steel Output at New High

Production of steel in September and in the first nine months of 1950 far exceeded the highest output for corresponding periods previously, says American Iron & Steel Institute.

The production of 8,200,020 net tons of ingots and steel for castings in September, with one less working day, was slightly less than the 8,230,317 tons for August. It was 1.6 million tons higher than the output of September, 1949. The month's record output raised the total for nine months to 71,608,358 tons, more than 6.5 million tons above output in the similar part of 1949 and more than 4.2 million tons over the production in the corresponding 1944 period when the previous nine-month record was made.

	—Open-hearth—		——Bessemer——		———Electric———		———Total———		Calculated	No.
Period 1950	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons Weekly	weeks in mo.
Jan.	7,131,519	96.5	379,252	80.6	419,601	71.9	7,930,372	93.9	1,790,152	4.43
Feb.	6,142,178	92.0	255,565	60.2	395,502	75.0	6,793,245	89.1	1,698,311	4.00
Mar.	6,747,680	91.3	265,726	56.5	473,630	81.1	7,487,036	88.7	1,690,076	4.43
1st. Qtr.	20,021,377	93.3	900,543	65.9	1,288,733	76.0	22,210,653	90.6	1,727,111	12.86
Apr.	7,314,733	102.2	407,909	89.5	490,030	86.7	8,212,672	100.4	1,914,376	4.29
May	7,597,837	102.8	437,006	92.9	517,044	88.6	8,551,887	101.3	1,930,449	4.43
June	7,218,570	100.9	406,944	89.3	506,001	89.5	8,131,515	99.4	1,895,458	4.29
2nd Qtr.	22,131,140	102.0	1,251,859	90.6	1,513,075	88.2	24,896,074	100.4	1,913,611	13.01
1st Half	42,152,517	97.7	2,152,402	78.3	2,801,808	82.2	47,106,727	95.5	1,820,902	25.87
July	7,220,214	96.9	380,317	79.8	470,763	78.4	8,071,294	94.7	1,826,085	4.42
*Aug.	7,315,215	98.0	405,118	84.8	509,984	84.7	8,230,317	96.3	1,857,859	4.43
†Sept.	7,264,264	100.7	409,216	88.7	526,540	90.6	8,200,020	99.3	1,915,893	4.28
†3rd Qtr.	21,799,693	98.5	1,194,651	84.4	1,507,287	84.5	24,501,631	96.8	1,866,080	13.13
†9 Mos.	63,952,210	98.0	3,347,053	80.4	4,309,095	83.0	71,608,358	95.9	1,836,112	39.00

Note—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons bessemer and 131,786 net tons electric ingots and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,490 net tons, bessemer 5,537,000 net tons, electric 6,871,310 net tons, total 99,392,800 net tons. Beginning July 1, 1950, the percentages of capacity operated are calculated on weekly capacities of 1,685,059 net tons open hearth, 107,806 net tons bessemer and 135,856 net tons electric ingots and steel for castings, total 1,928,721 net tons; based on annual capacities as of July 1, 1950, as follows: Open hearth 87,858,990 net tons, bessemer 5,621,000 net tons, electric 7,083,510 net tons, total 100,563,500 net tons.
* Revised. † Preliminary figures, subject to revision.

Steel Wages, Prices Going Up

Early wage settlement expected to give steelworkers substantial increase. Adjustments in prices will follow quickly. Minimum average rise of $5 a ton probable

LOOK for an early increase in steel wages.

Steel prices will go up soon after the wage increase is announced.

The United Steelworkers will receive a substantial wage increase although it will be considerably less than the 25 cents an hour its leaders are reported to be asking for bargaining purposes. Industry men believe the union will be happy to get a settlement for 15 cents an hour, or slightly less than 10 per cent of present average hourly earnings.

Under today's conditions, the producers are not going to haggle too long over the amount. If the union is at all reasonable, an early settlement is in prospect.

It Can't Be Absorbed—A price increase will follow hard on the heels of the wage grant. All producers agree that it must.

A 10 per cent wage increase would cost producers about $250 million a year. No producer believes this can be absorbed.

They point out that the industry is embarked on a huge expansion program. Financing of this program requires that their profit position be maintained.

How Much? — Pending the wage settlement, the amount of the price increase cannot be estimated accurately. Some industry spokesmen suggest that to take care of the wage increase alone, a percentage price increase half as large as the percentage wage increase would be necessary. That would mean if wages go up 10 per cent, prices would have to advance 5 per cent, or about $5 a ton.

A wage increase would be taken care of but not other increases in costs.

Advances are unlikely to be across the board, but will be made selectively and will vary on the different steel products.

Marking Time—Wage talks started between a number of the larger steel producers and union negotiators last week. They were exploratory.

Awaited was the meeting Oct. 16 of United States Steel representatives and the union chieftains. In most wage settlements in the past, the agreement between U. S. Steel and the union has established a pattern for the industry.

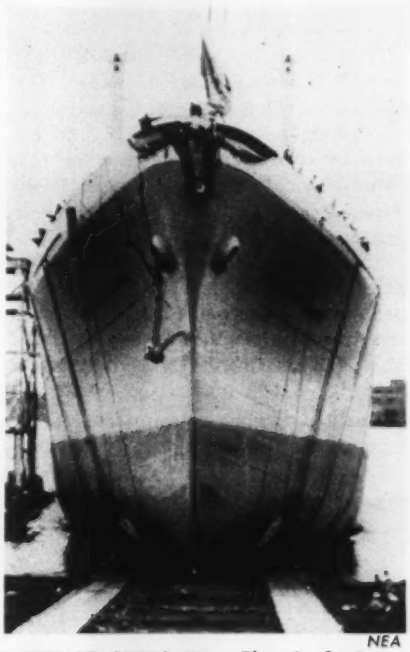
You're Next—After an agreement has been reached with basic industry the union will turn its attention to the steel fabricators, processors and other metalworking companies with which it has contracts.

Wages Outstrip Living Costs

Steelworkers' weekly wages have increased twice as much as the cost of living since the prewar period of 1935-1939. The weekly pay envelope of the steelworker today contains enough purchasing power to obtain 44 per cent more goods and services than the pay envelope of the late thirties.

Average weekly wage of steelworkers in July was $67.83, an increase of $40.71 over the 5-year prewar period, says the American Iron & Steel Institute.

This results in a 44 per cent increase in his "real" wages, or his purchasing power after allowance for the increase in living. These figures do not include the substantially increased payments into pension and welfare funds.



NEA

DEFENSE STEPS IN: The S. S. President Adams sliding down the ways at Camden, N. J., is destined for the Defense Department. Built originally for the American President Lines by New York Shipbuilding Corp., the ship will be finished as a troop carrier (See STEEL, Sept. 25, p. 42, April 24, p. 50)

August Payrolls Second Highest

Steel payrolls in August were the second highest in history and brought the total industry's payrolls for the first eight months to above $1.5 billion. The August payroll totaled $206,623,000, nearly $18 million more than in July and only about $500,000 less than the record set in March, 1949. Statistics are those of the American Iron & Steel Institute.

Payments to hourly, piecework and tonnage workers averaged $1.717 in August, compared with $1.744 in July and $1.682 in August, 1949. These employees worked an average of 39.7 hours per week.

The industry's employment continued the steady rise that has been in progress for about a year, reaching an estimated total of 648,900 in August, compared with 603,100 in August, 1949.

Engineer Pool Drying Up

An "alarming" shortage of trained engineers over the next several years is predicted by the American Society for Engineering Education. The forecast is based on a survey of enrollment in the nation's engineering schools.

Freshman engineering enrollments are 27 per cent below last year's and 20 per cent below the figure at the start of World War II. Last year's record-breaking graduating class of 50,000 has already been absorbed, and all branches of engineering have been listed as critical by the government.

This year's entering class, estimated at 26,500, will ultimately produce about 13,000 graduates in 1954. That is less than half the normal peacetime number required to meet industrial and other demands. Total engineering enrollment for 1950 is 50 per cent of the 1948 figure.

Less Manpower Than Materials

Skilled manpower is in even shorter supply than materials. A survey by the Association of Consulting Management Engineers discloses a shortage of competent industrial engineers and the need for training men for jobs at all management levels.

Expecting salaries and wages to be frozen, many clients of consulting firms are now evaluating or re-evaluating all positions. Rates of pay for various jobs are being established in line with going rates in the area for comparable positions, the report indicates.

The association warns against a too rapid break-up of the sales force because the greater part of our economy will still be concerned with civilian business.

Tool Builders Brace for Defense Orders

Speakers at the NMTBA meeting report most business thus far is civilian. The problem is: How to handle inevitable defense orders on top of heavy peacetime demand

"THE DIRECT impact of military production has as yet barely touched the machine tool industry," David Ayr told delegates to the annual meeting of the National Machine Tool Builders' Association in Toronto last week. Mr. Ayr is retiring president of the association and president of Hendey Machine Co.

The industry, keystone in any rearmament program, is doing a sensational volume of business which is almost entirely civilian orders precipitated by the Korean war. The NMTBA index went from 253.1 in July to 307.3 in August. The problem, then, before the industry is: How to handle the defense business, which will inevitably come, on top of the civilian volume?

Intelligent Griping—Mr. Ayr and L. D. McDonald, chairman of the association's committee on government relations and executive vice president of Warner & Swasey Co., both agree that the answer partly lies in an intelligent approach in Washington to get a wise treatment of the industry by government. Mr. Ayr chides machine tool builders for pointless complaints to federal officials during World War II, although the industry did have many legitimate gripes.

Messrs. Ayr and McDonald believe that machine tool builders in their approach to Washington should:

1. Point out the industry's strategic position and the importance of its getting sufficient steel.

2. Fight for deferments from the armed forces of personnel known to be vital from previous experience.

3. Urge more liberal rules on machine tool exports to Atlantic Pact nations.

Richard E. LeBlond
NMTBA 1950-51 President

4. Urge intelligent renegotiation.

5. Continue to fight for long-term liberalization of tax depreciation.

6. Take advantage of new five-year amortization provisions in tax laws.

New Tack on Renegotiation—"We should be renegotiated," says Mr. McDonald, "only on that portion of our production which applies to the defense effort. Assume that a machine tool cost a manufacturer $4000. Treasury says its useful life is 20 years. The emergency lasts five years. Three-fourths of the purchase price should be applicable to postwar peacetime business. The builder of the machine should be renegotiated only on one-fourth of the purchase price, or $1000 instead of $4000."

Besides urging administrative reforms for renegotiation, Mr. McDonald says the new Emergency Facilities Law should be watched closely. Facilities may be amortized under provisions of an act similar to that during World War II. The law has not yet been implemented because no agency has been designated to handle its provisions.

Facilities to be written off must be certified as essential to war needs. The degree of the certification—a tricky point—may depend upon the extent to which a facility is actually used for war purposes. A machine tool used partly for military and partly for peacetime production may be certified as only 40 per cent necessary for defense purposes, and thus only 40 per cent of its cost may be amortized in five years.

In the Woodpile—Mr. McDonald indicates one encouraging factor in the amortization law that has to do with taxes to be paid in connection with the sale of fully or partially amortized facilities. That provision, he says, "points to the establishment of a precedent which may lead eventually to the recognition by Congress of optional depreciation."

New Officials — New officers of NMTBA for 1950-51 are: President, Richard E. LeBlond, president of R. K. LeBlond Machine Tool Co., Cincinnati; first vice president, Frederick S. Blackall Jr., president and treasurer of Taft-Peirce Mfg. Co., Woonsocket, R. I.; second vice president, Swan E. Bergstrom, vice president of Cincinnati Milling Machine Co., Cincinnati; treasurer (re-elected), Jerome A. Raterman, president of Monarch Machine Tool Co., Sidney, O. New directors are Mr. Raterman; Edward W. Miller, president of Fellows Gear Shaper Co., Springfield, Vt.; and Francis J. Trecker, president of Kearney & Trecker Corp., Milwaukee.

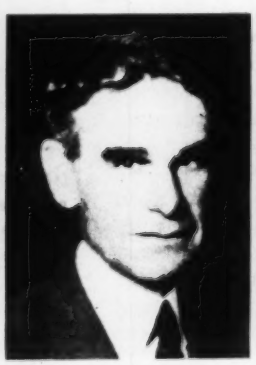
AMTDA Elects Its New Officers

Officers elected at the 26th annual meeting of the American Machine Tool Distributors' Association are:

BLACKALL

BERGSTROM

RATERMAN



MILLER

TRECKER

President, E. B. MacDonald, Syracuse Supply Co., Syracuse, N. Y.; vice president, E. J. Seifrat, Seifrat-Elstad Machinery Co., Dayton, O.; second vice president, John M. Riordan, Riordan Machinery Co., Detroit; secretary-treasurer, George B. McClennen, Delta Equipment Co., Philadelphia.

Members of the executive committee who were selected for terms expiring in 1953 are: Arlington Nuetzel, Blackman & Nuetzel Machinery Co., St. Louis; Thomas M. Rees, Rees Machinery Co., Pittsburgh; and Thomas R. Rudel, Rudel Machinery Co. Inc., New York.

Steel Pinch Hurts

Machine tool builders want to be allocated steel and other scarce materials

MACHINE tool builders are in danger of becoming crippled for lack of steel; the remedy is allocation of that and other scarce materials to the tool manufacturers.

Get Together—So says Donald M. Pattison, vice president of Warner & Swasey Co., Cleveland, who spoke last week before an industry mobilization group seeking to co-ordinate government and machine tool industry defense efforts. Chairman of the organization is Herbert L. Tigges, executive vice president of Baker Bros. Inc., Toledo. Attending the meeting were representatives of the machine tool builders and distributors, used machinery dealers and the U. S. government. It was held just before the annual meeting in Toronto, Canada, of the National Machine Tool Builders' Association.

Mr. Pattison says that a number of machine tool companies may have to lay off men because of dwindling stocks of materials. The need for steel will be even more acute if phantom orders are activated.

Alive and Kicking—The phantom order program is anything but dead, says R. Vidinghoff of Machinery Associates Inc., Philadelphia, and Capt. M. R. Henning USN (Ret.) of National Security Resources Board's manufacturing and production division. Captain Henning cites the success of the system during World War II. He predicts reactivation of phantom orders as soon as the defense production program becomes more definitely outlined.

Another World War II device that may be revived soon is the Lloyd Committees for industry co-operation with district ordnance offices on production and procurement problems.

GE Opens $18 Million Research Laboratory

PURE research acquired a new workshop last week, as General Electric Co. dedicated its $18 million laboratory at the Knolls. Located on a 180-acre tract near Schenectady, N. Y., the new facility is a far cry from the original research laboratory which was housed in a barn owned by Charles P. Steinmetz.

The main T-shaped building of the laboratory is five stories high and has 159,000 square feet of usable floor space. It houses physics, chemistry and metallurgical laboratories, glass-blowing, machine and wood working shops as well as an auditorium and offices.

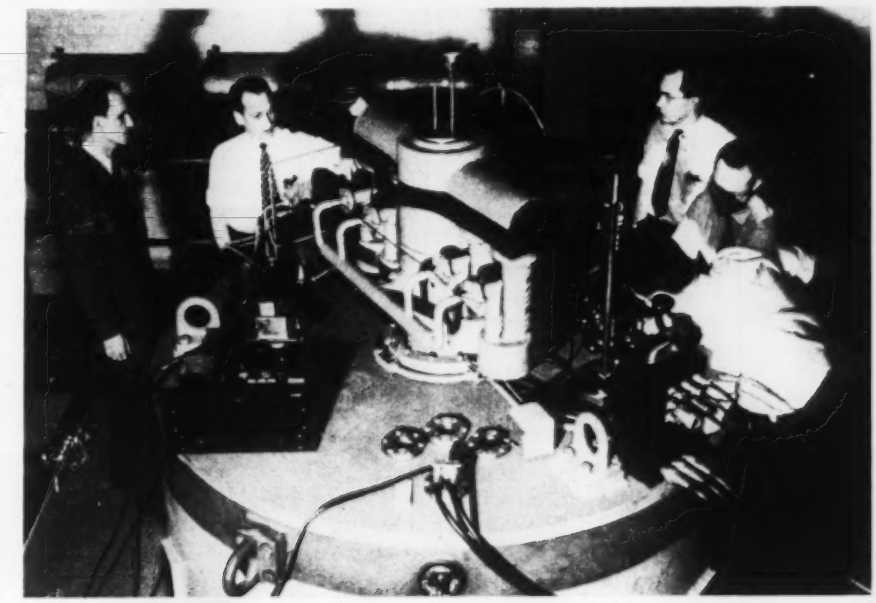
Down to Brass Tacks—The metallurgy division occupies most of one floor. Here scientists study the fundamental facts about metals, trying to determine why they behave as they do. Equipment includes small furnaces for preparing experimental quantities of new alloys; light microscopes and an electron microscope; apparatus utilizing electrons as well as x-rays to examine the crystal structure of metals.

Other principal buildings constituting the laboratory are the radiation laboratory, which will house a new type of atom smasher, the 300 million-volt nonferromagnetic synchrotron; the low temperature laboratory, for experiments at temperatures near absolute zero (minus 460° F); a chemical pilot plant, for testing new chemical processes on a semi-production basis.

Half Century of Science—Formal dedication of the new buildings was part of the research laboratory's 50th anniversary celebration. The National Academy of Sciences held its autumn meeting at the laboratory, as part of the week-long affair.

Dr. Willis R. Whitney founded the laboratory in October, 1900. He had one assistant and spent only half of his time at the laboratory. The new installation has a staff of over 800 persons.

Portrait in Glass—Dr. C. G. Suits, GE vice president and director of research heads the laboratory now. During the dedication ceremonies Dr. Suits unveiled two glass portraits of his predecessors, Dr. Whitney and Dr. William D. Coolidge. These portraits are panels 33 x 57 inches. They were made by a new process developed by Corning Glass Works.



GE 300-MILLION-VOLT SYNCHROTRON FOR HIGH ENERGY RADIATION
. . . a new type of atom smasher without an iron core

Helping Hand—A big company's major contribution to the public is through research, says GE President Charles E. Wilson, who spoke at the laboratory dedication. The cost and complexity of research is today so great, he points out, that only government and large firms can afford to do a lot of it. Large companies are best suited to transform an experimental project into a flourishing industry.

"Research, for industry, began as a life insurance policy in which a company invested to make sure it had a future," says Mr. Wilson. Now, research has a far broader function, to help bolster the nation's entire economy and security.

Another Plant in Canada

Allis-Chalmers Rumley Ltd buys plant of Erie Iron Works at St. Thomas, Ont.

ALLIS-CHALMERS Rumley Ltd., a Canadian subsidiary of Allis-Chalmers Mfg. Co., bought a plant at St. Thomas, Ont., W. C. Johnson, executive vice president for the parent company's general machinery division, says. Besides the plant and adjoining acreage, an option was taken on an additional 24 acres. Foremost among the products to be produced in the plant will be controls for diesel locomotives made by General Motors Corp. at a new plant in London, Ont.

The Allis-Chalmers subsidiary bought the plant of Erie Iron Works. It was completed in 1948 and has 19,000 square feet of floor space. No purchase price was disclosed. The plant has a work force of over 100. Allis-Chalmers took possession last week; by yearend it hopes to install machine tools for the operation. In the meantime assembly operations will be carried on.

Allis-Chalmers Rumley owns warehouses and office quarters in several Canadian cities. Previously it has been a tractor division operation of the parent company. Acquisition of the St. Thomas plant brings the general machinery division into the setup.

Bliss Moves Offices, Engineering

E. W. Bliss Co., Toledo, O., manufacturer of pressed metal machinery, can and container machinery, rolling mill equipment and special machinery, moved its advertising, general sales and engineering department to its new Canton, O., plant the first of this month.

Columbus McKinnon Gets Dixon

Because of high freight rates and uncertainty about the basing point system, Columbus McKinnon Chain Corp., Tonawanda, N. Y., had been considering for several years the purchase of a location in or near Chicago.

The manufacturer of chain products for the automotive, agricultural, industrial and marine markets finally achieved its aim when it bought the plant, equipment and inventory of Dixon Chain Mfg. Co. Inc., Dixon, Ill. Columbus McKinnon expects to be operating the Dixon plant soon.

Franz T. Stone, president of Columbus McKinnon says his company will now have plants at Tonawanda, North Tonawanda and Angola, N. Y.; subsidiary companies in St. Catherines, Ont., and Johannesburg, South Africa as well as the Dixon plant. Chisholm-Moore Hoist Corp. Tonawanda, manufacturer of electric and chain hoists and other overhead materials handling equipment, is an affiliate of Columbus McKinnon.

Vanadium Corp. Will Expand

Vanadium Corp. of America disclosed plans to spend about $4 million for expansion and modernization of its plant in Niagara Falls, N. Y. The program will begin next summer and include installation of modern furnaces and a building addition.

McKinnon Industries Buys Land

The Transport Department of Ottawa, Toronto, Ont., says negotiations were completed for the sale of 130 acres of Crown land on the east bank of the Welland canal near Thorold, Ont., to facilitate a $10 million industrial expansion for McKinnon Industries Ltd. And department officials say construction of a malleable iron foundry and power plant would be undertaken and preliminary work started at once.

Purchase of the land by McKinnon would permit a long-term development that is calculated to meet expansion in the auto industry. Company spending will be for equipment and tooling for the reinstated Canadian manufacture of Buicks early in 1951.

More Firms Make Atom Items

Eighty-four U. S. firms are manufacturing 180 different types of radiation detection instruments and their components and accessories, according to the Atomic Energy Commission's Radiation Instrument Catalog, now on sale through the Office of Technical Services of the Department of Commerce.

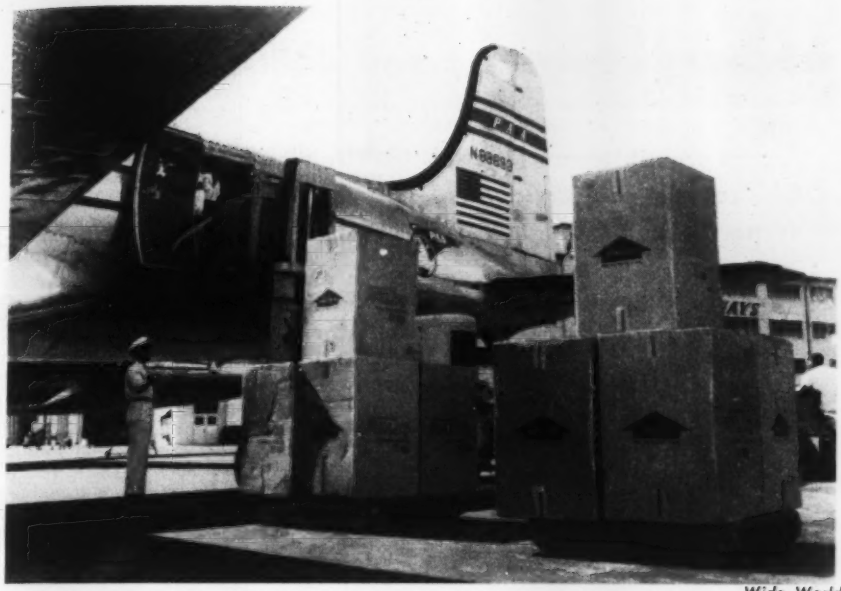
Since 1949, 17 more companies have begun making this equipment; 78 more instrument types are available this year than last. In all, the catalog lists 543 specific items of equipment now commercially available in the U. S., including geiger counters, ionization chambers, scintillation counters, etc.

U.S. Engineering Corp. Formed

Formation of a new Milwaukee firm, U. S. Engineering Corp., was announced by Charles T. Jorgensen, one of the company's four owners. Offices were opened in the city and a

Wide World

GOT A PARKING PROBLEM? Plans for 20 new multideck garages affording parking space for about 10,000 cars in California, were disclosed by Milo B. French (left) president of Hollingsworth Multideck Corp. of California. He says 14 are planned for downtown Los Angeles and other cities of the state. The four-story structure has 95,000 square feet of parking area, enough for 412 automobiles and is all steel. Movable interfloor ramps are counterbalanced and can be moved manually. They also come with a gear reduction drive powered electrically. Mr. French, Ellis White and R. B. Austrian look over the one-inch-to-the-foot scale model of the garage



Wide World

TV CLIPPER: Television is taking to the air as 217 sets, weighing 33,000 pounds, are flown from Miami, Fla., to Havana, Cuba, aboard clippers of Pan American World Airways. The sets are being sent to Havana in anticipation of the completion of a television transmitter that will provide the Cuban capital with one of the first television stations in Latin America. The $50,000 shipment is being made by Philco Co. to Cia. Cubana Radio Philco, S.A., in Havana

district sales office was opened in Detroit. The firm will engineer and erect special conveyor systems. Manufacturing will be done for U. S. Engineering on a contract basis.

Thor Expanding in Two Places

A $300,000 machinery expansion program at Thor Corp.'s Aurora, Ill., and Los Angeles works involves installation of new high-speed equipment at vital points of production, Neil C. Hurley, president of the Chicago firm, says.

Biggest expenditure in the progrem was for a battery of automatic lathes to be stationed in departments at the head of the Aurora production line performing initial operations on all parts. New die casting machines are being installed at Aurora to supplement existing equipment feeding castings of Silver Line and Copper Line electric tools in the production line. Other new equipment includes a thread-rolling machine, an upsetting machine.

In the Los Angeles plant new milling machines, radial drill presses and grinding machines are being added to the line producing pneumatic mining and contractors' tools.

Fred W. Wappat Assets Sold

Paul Jones, president of American Security (ASC Corporation), Marion, Ind., and president of Cummins Portable Tools Division of Cummins Business Machines Corp., Chicago, announced the purchase of the assets of Fred W. Wappat Inc., Mayville, N. Y., for 25 years manufacturer of portable electric hand-saws for the industrial and heavy construction fields.

The newly acquired property will be operated by Cummins as the Fred W. Wappat Division. All Wappat personnel and the identity of the Wappat line will be retained.

Ramos Buys Horton

Ramos Enterprises, Cincinnati investment corporation, acquired Horton Mfg. Co., Ft. Wayne, Ind., manufacturer of home washing machines, and American Saw Mill Machine Co., Hackettstown, N. J. Albert E. Askerberg, former president of Horton, becomes executive vice president and general manager. Reorganization of the New Jersey firm was deferred. Other business of Ramos includes Frederick Iron & Steel Co., Frederick, Md., Sidney Machine Tool Co., Sidney, O., Sheet Steel Galvanizing Co., Indianapolis, and Bausch Machine Tool Co., Springfield, Mass.

Lone Star Starts Casting Pipe

Lone Star Steel Co.'s new foundry for centrifugally casting iron pipe is in operation at Lone Star, Tex.

Capable of an annual output of 80,000 tons of pressure pipe, the new foundry cost $1.5 million and gives the company another outlet for its pig iron.

The company hopes to move further toward a completely integrated steel mill.

Company To Make Own Steel

A company which previously has not made its own steel is constructing a melt shop. It's the A. Finkl & Sons Co., Chicago, which will install two 20-ton electric furnaces with an annual capacity of 53,000 tons of carbon and alloy steel forging ingots. Included in the installation will be isothermal annealing furnaces.

Addition of this equipment was made necessary by changing conditions, such as increased freight rates and adoption of mill pricing of steel.

The new facilities will be adjacent to the company's No. 1 plant and in a building acquired from Tarrant Foundry Co. recently when the latter ceased operations.

Ingot sizes will range from 20 to 59 inches in diameter and from 20,000 to 100,000 pounds each in weight.

Completion of the new steelmaking facilities is scheduled for Mar. 1, 1951.

Porter Buys Conners Steel

Acquisition of Conners Steel Co., Birmingham, was announced late last week by T. M. Evans, who is president of the H. K. Porter Co. Inc., Pittsburgh.

Details of the transfer were not immediately available, but it is understood that considerable plant improvement and development will be undertaken.

Conners Steel was established in Birmingham in 1907 by the late George W. Conners. The company operates electric furnaces for production of ingots, two rolling mills and various fabricating and assembly shops.

Carnegie To Rebuild Stack

Carnegie-Illinois Steel Corp. will rebuild blast furnace No. 3 at Isabella Furnaces, Etna, Pa., for the production of ferromanganese.

Decision to rebuild the stack was made to aid in the government's defense program and is a temporary measure, say officials of this U. S. Steel Corp. subsidiary.

Rebuilding of the Isabella stack, which has been idle for more than a year, will permit production of pig iron at one of the company's Monongahela valley blast furnaces, which otherwise would be scheduled to produce ferromanganese.

The rebuilding will start at once; the furnace is expected to be placed in operation by the end of this year.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

They only cost a few cents each but the pamphlets available from the Government Printing Office can pay big dividends in helping you land orders for defense work

JUDICIOUS investment of $1.35 and a little foot work may bring you big dividends in doing business with the government.

Floyd Brinkley of the Munitions Board advises STEEL that these pamphlets available from the Superintendent of Documents, Government Printing Office, Washington 25, can help save time and land orders for defense work:

"How to Sell to the United States Army," 30 cents.

"Purchased Items and Purchasing Locations of the Department of the Navy," 15 cents.

"Selling to the Navy," 15 cents.

"Follow Me, a Guide for Selling to the United States Air Force," 15 cents.

"Production Allocation Manual," 45 cents.

"Principles of Plant Protection," 15 cents.

B. K. Slaughter of Commerce's Small Business Division says that manufacturers interested in obtaining prime contracts and in learning of opportunities for subcontracts should make use of these three services:

1. A "Government Procurement Manual" listing all items purchased by the government, all purchasing locations, what items are purchased at these locations, and methods of purchase. May be seen at all Commerce Department field offices and at 1000 libraries, chambers of commerce and other co-operating offices.

2. "Daily Consolidated Synopses of Government Purchases" listing all bid openings, opening dates, items to be purchased, quantities, and names and addresses of purchasing offices. May be seen at all Commerce Department field offices and at 4500 co-operating offices all over the country.

3. "Weekly Consolidated Listings of Contract Awards" covering both bid and negotiated contract awards, but not secret awards. May be seen at all Commerce Department field offices and 4500 co-operating offices.

The "Daily Consolidated Synopses of Government Purchases" and the "Weekly Consolidated Listings of Contract Awards" are available from Fred Hollowell, 3603 R St. N. W., Washington, for airmail delivery on a subscription basis.

Wide World

ECONOMIC STABILIZER: Dr. Alan Valentine, former president of the University of Rochester, was appointed by President Truman to be administrator of the new Economic Stabilization Agency. The independent agency was created under the Defense Production Act to keep the economy on an even keel for rearmament

Procurement Reorganized . . .

Army Engineers procurement has been reorganized for quick wartime expansion with basic procurement offices located in: Chicago, for construction equipment; Philadelphia, utilities; St. Louis, construction materials; New York, surveying, mapping; Pittsburgh, bridges, floating equipment.

Historical Considerations . . .

Although the ban on ferrous scrap exports (except to Canada) by the Office of International Trade is still in force, there may be modifications to permit small shipments. They'll go to countries historically dependent on U. S. scrap—Mexico; to a small extent, Chile and Brazil; and occasionally, Argentina.

Third quarter applications for licenses to ship 25,000 to 30,000 tons to Mexico still are pending, and applications are expected for approximately the same tonnage for the fourth quarter. OIT authorized an export quota of 100,000 tons in the first quarter of 1950 and cut it to 50,000 tons in the second quarter and wiped it out altogether in the third quarter to conserve domestic scrap supplies. A factor that will influence the decision on these applications is the prospect for importing more scrap now that the suspension of the import duty until next June 30 is in effect.

Current advices are that imports will be small in view of increasing consumption in Germany and Europe generally.

Research on Beryllium . . .

Extrusion of beryllium shapes and tubing is not only possible commercially but the extruded metal has superior physical properties, states a declassified paper by the Atomic Energy Commission. Like many other papers—classified and unclassified—it may be seen at the 32 depositary libraries around the country. If you don't know where the nearest such library is, consult your local library for help. The beryllium paper is identified as AECD-2883.

A Lift for Munitions Board . . .

Rear Adm. Morton L. Ring, who is government chairman of the Munitions Boards' new Storage & Handling Industry Advisory Committee, will get a lift from these representatives from the materials handling equipment industry:

W. Van C. Brandt, Electric Industrial Truck Association, Philadelphia; C. F. Dietz, president, Lamson Corp., Syracuse, N. Y.; J. A. Goldthwait, executive vice president, Associated Lift Truck & Portable Elevator Manufacturers, Stamford, Conn.; M. K. Miller, GMC Truck and Coach Division, Detroit; D. W. Pennock, president, American Materials Handling Society, Boston; W. E. Schirmer, president, Clark Equipment Co., Buchanan, Mich.; and F. D. Taylor, International Harvester Co., Chicago.

Prefab Loan Setup Shifts . . .

Government loans to finance production of prefabricated housing and prefabricated components, formerly made by the Reconstruction Finance Corp., hereafter will be made by the newly created Division of Loans for Prefabricated Housing, Housing and Home Finance Agency, Washington.

European Nations Set To Fight Inflation

Widespread price rises threatens as export steel quotations jump. The OEEC is studying the problem, particularly as to how rearmament affects it

EUROPEAN nations are bracing for a fight against inflation. Rising prices are not yet widespread, but they threaten to be.

One ominous sign of an approaching threat to stability is the higher quotations on export steel. Steel bars, for example, are now bringing about $82 per metric ton for a hard-currency destination like the U. S. and $85 to $90 for a soft-currency destination like Latin America, India, Pakistan and South Africa. Belgian exporters, who generally charge the highest of Western Europeans, are getting $90 per metric ton for concrete steel, $84-$90 for structural, $108-$110 for plates and $95-$100 for wire rods.

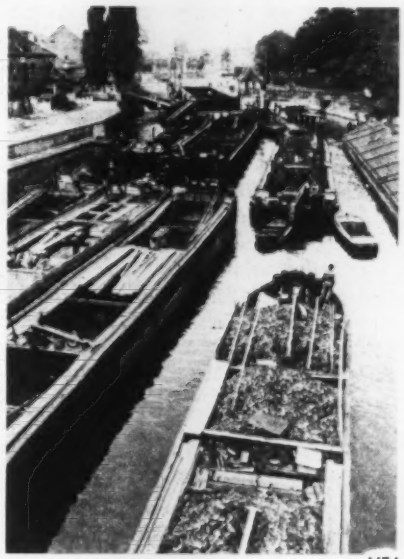
Build the Dikes—The Organization for European Economic Cooperation, a group first formed to help administer the Marshall Plan, is studying the problem, particularly as to how rearmament affects it. OEEC favors joint action to insure equitable distribution of scarce raw materials. It will take steps to keep raw material prices from rising too drastically.

France and West Germany thus far have shown the most concern about rising prices. France is importing scarce raw materials and is prohibiting or restricting exports of many products, including steel, scrap and some chemicals. The German parliament and press are debating the effects of rearmament. The Allies want the West Germans to spend $1.9 billion a year on defense. The Germans claim that would set off an inflationary spiral that would ruin their precariously balanced economy.

France Tries Legislation

French anti-inflation action includes a series of laws penalizing speculators, hoarders and price boosters. Price-fixing powers of the government will be used more. Existing legislation against profiteering will be more strictly applied.

A detriment to the French situation is the lag in some industrial production. The combined output of ingot steel in France and the Saar in the first half of 1950 was 5.5 million net tons or about 500,000 tons less than in the first half of 1949. Production of railroad equipment manufacturers has also declined. The nation's steel capacity will increase before the end of the year when Societe Normande de Metallurgie, smashed during the war, will begin making steel again.



NEA

DELAYING ACTION: East German barges bog down at the British sector canal locks of Spandau when the British military police impose new transportation regulations. Careful checking of cargo weight, special stamps and a new fee are required. Although the British say, "We are checking on barge documents," many observers think the regulations are tit for tat retaliation, imposed for long-standing Soviet rules on Western barges

German Steel Firms Disbanded

West Germans claim that the nation's precarious economic balance is not being helped by the Allies' decision to liquidate six major steel producers, even though their plant operations will not be affected.

The Germans argue that the financial dislocations involved will be dangerous. Vereinigte Stahlwerke, Friedrich Krupp, Mannesmann, Kloecknerwerke, Hoesch and Gutehoffnungshuette will be disbanded. Although these companies will be dissolved, reorganization plans are not complete.

The removal of the steel production ceiling has not produced any tangible results so far. The lifting of the ingot ceiling is not enough because Germany needs additional finishing capacity, particularly for sheets. Present sheet rolling mills have been sold out for a year ahead.

The more liberal attitude toward steel production has spurred the decision to reopen August Thyssen Huette. About $475,000 will be needed to get the plant in the North Rhine-Westphalia area of Germany into production. Its annual capacity will be 660,000 net tons of pig iron and 128,000 tons of steel ingots. The Bonn government may set aside some of the money for the plant, but much of it must be raised elsewhere, perhaps in the U. S.

U.K. Braces for Nationalization

The steel industry in Great Britain is awaiting nationalization with a good deal of apprehension. Steel users generally are bitterly opposed to it. Nationalization will take place next Feb. 15. It is possible, but not probable, that the sharp division of opinion throughout the country will bring a general election soon and the repeal of the Nationalization Act if the Conservatives win.

Steel production has increased steadily and in September exceeded the annual rate of 17.5 million net ingot tons. Steel sheets are the most difficult to obtain, but all products are in short supply. The situation will be even worse when the full impact of rearmament is felt.

Auto producers will probably be hard hit when steel shortages become even more acute. Output is up 25 per cent this year over last and would be up even more were more steel available.

Potential domestic buyers of cars will have to wait even longer. Exports will claim an increasing percentage of production; 66 per cent of the total auto output was exported in 1949 and 81 per cent thus far this year.

Norwegian Prices Rising

Rising prices in Norway are causing labor unrest. The cost-of-living index for Sept. 15 rose past 165.6, the point at which negotiations for higher wages may be demanded by trade unions. The extent of the wage adjustments is now a subject of hot debate that may cause the first serious strikes in Norway since the war.

Norway's industrial production is rising and for the year may reach an alltime high. For the first half of 1950 the index stood at 147, compared with the 1938 level of 100. That was an increase of 7 per cent over the first half of 1949 and the highest figure noted for any half year. Export industries rose the most.

Savings Bond Drive On

Metalworking firms getting on bandwagon to get employees to use payroll savings plan

METALWORKING executives like one payroll deduction that is being used more frequently than a year ago. The Treasury Department is quietly pushing a campaign to sell savings bonds.

Metalworking likes the payroll deduction method of selling bonds because it: 1. Stabilizes the economy; 2. gives added security to employees; 3. drains off excess buying power when industry can sell practically everything it makes; 4. gives a nest egg to consumers that can be used when times are not so good.

Starting Point—Treasury is starting its renewed drive among steel companies. Already 90,100 additional employees of National Tube Co., Allegheny Ludlum Steel Corp., Bethlehem Steel Co., American Steel & Wire Co., Jones & Laughlin Steel Co., Great Lakes Steel Co., Weirton Steel Co., Carnegie-Illinois Steel Corp. and Youngstown Sheet & Tube Co. have signed up for an additional $22.5 million in Series E bonds per year through payroll deductions. At least 70,000 more workers will be signed up by other steel companies with campaigns already scheduled for November by Inland, Armco, Crucible, American Bridge and Colorado Fuel & Iron.

CLIMBING UP: Folks at the Lorain Works of National Tube Co. are building up a fund of buying dollars by monthly purchases of U.S. Savings Bonds. The figure climbing the Payroll Savings Plan ladder shows exactly where employee participation stood some time ago

Treasury will spread the drive to other companies in metalworking next. Koppers Co., American Standard, and General Motors are already on the bandwagon.

Best bond-selling record this year is shown by National Tube. At the beginning of its voluntary campaign June 23, 6989 workers were subscribing to bonds through payroll deductions. When the campaign ended July 31, 20,733 or 80.6 per cent of all employees were subscribing.

What To Do—If you're contemplating a campaign, your local U. S. Treasury bond representative can help tailor a plan to your requirements. He also has literature, movies and can help indoctrinate your personnel participating in a campaign. You can also directly contact Treasury Secretary John W. Snyder.

Treasury has set up a goal to sign up at least 50 per cent of all employees in a plant. Bond sales have been running ahead of redemptions. In 1948, the net gain was $500 million and in 1949, $750 million. Scare buying at the beginning of the Korean war bulged redemptions.

Inhibitor: Infantry Delight

An infantryman's delight should be a vapor phase inhibitor. No, it has nothing to do with sex; it has to do with packaging and should save hours of time in cleaning rifles.

The Munitions Board has a packaging program in progress that may lead to volatile corrosion inhibitor wrappings in which steel end products may be packed. When tests are completed, results will be made available to industry, too.

The idea is to give long-term protection to such products as rifles. Tests indicate that a box of 10 rifles inhibitor-packed can be unpacked, with rifles ready for use, in 15 minutes. In World War II, firearms were coated with cosmoline. It took 2 hours and 45 minutes per rifle to get the stuff off.

Munitions Board's Packaging Industry Advisory Committee, preparing for whatever emergency tasks may lie ahead, has organized four subcommittees whose fields of responsibility embrace the main steps of packaging procedure. Subcommittees and their chairmen are: Preservation, M. K. Miller, General Motors Corp.; Packaging, Dr. C. E. Waring, Davison Chemical Co.; Identification, John K. Mount, Insurance Co. of North America; Packing, P. O. Vogt, General Electric Co.; Testing, Edward Dahill, Association of American Railroads; and Training, J. D. Malcolmson, Robert Gair Co. Inc.

Ordnance Depot To Be Complete

A $35 million contract for construction of additional facilities at the Naval Ordnance Depot, Shumaker, Ark., has been awarded by the Navy to four combined contracting firms which handled the original construction project during World War II.

Production lines which had been partially constructed when work on the Shumaker depot was stopped after V-J Day will be completed under the contract.

"E" Areas Drop to 11

Rising employment has reduced the number of "E" areas—regions where unemployment is 12 per cent or more—to 11. Forty-three areas were classified as "E" in January and 14 in July, Martinsburg, W. Va., Providence, R. I., and Newport News-Hampton, Va., are the cities that got off the list. Major industrial cities still on the list are Lawrence, Mass., and Scranton and Wilkes-Barre, Pa.

Holding Out?

GOT INSTRUCTIONS on withholding of increased income taxes on wages paid on or after the first of this month? If you haven't, see your local office of the Bureau of Internal Revenue.

George J. Schoeneman, commissioner of internal revenue, explains that failure of any employer to withhold at the proper rate on payments made on or after Oct. 1 does not affect the liability of the employee to meet his full tax liability as required by the Revenue Act of 1950 when making his return for 1950.

Westinghouse Gives Pay

Westinghouse Electric Corp. employees who have been with the firm for more than one year will receive a month's extra pay if they enter the armed services while active conflict continues.

Under this policy, retroactive to July 1, the company will also pay group life insurance premiums for three months for those entering military services and will pay any current year's vacation time still due.

Toledo Plant 2 Shapes Up

Doehler-Jarvis recognizes one limit on size: Industrial engineers' ingenuity

A RELATIVELY SMALL manufacturing plant and 13 acres of property that Doehler-Jarvis Corp. bought on Dixie highway in Toledo, O., less than two years ago is shaping up into a modern and progressively arranged die-casting and finishing plant. When completed sometime late this year—if war demands on building materials permit—Toledo Plant No. 2, will house alloying, casting, finishing and shipping operations—all under one roof.

Over $3.5 million will go into the overall expansion of the plant since the company got it. Of that figure, $1.9 million will have been spent by yearend. When completed the plant will have an area of 211,495 square feet. By that time about 1000 employees will be needed to carry on normal operations.

Horizons Unlimited—An outstanding feature of the new plant is that it is being laid out and constructed to accommodate the ever increasing size in die castings. Plant No. 2 turns out the grille for the 1951 Packard. The grille is the largest auto grille ever die cast. Says Board Chairman H. H. Doehler: "The only limit as to size that we recognize in die casting is the ingenuity of industrial engineers."

Doehler-Jarvis started in Toledo in 1914 as a small operation in the loft of a factory building. At the outset there were a mere handful of employees, but by the end of World War I the company—Doehler Die Casting Co.—had expanded to about 400 workers and had opened its own plant building. By 1935 there were nearly 1000 employees and when the U. S. entered World War II Doehler had 1450 employees. Today's figure of 3000 more than doubles the payroll of ten years ago.

Quick Change—It was the automobile industry that lured Mr. Doehler to Toledo. His first die casting jobs were made largely from tin and lead base alloys.

Mr. Doehler's first assignment was the making of bearings for the then infant auto industry. He didn't put all his eggs in one basket, though: Time showed him hundreds of applications of die castings.

Now, 50 years after he walked off a ship in New York as a German immigrant of 19, Mr. Doehler is still exploring and expanding. Plant No. 2 is the newest of the seven Doehler-Jarvis plants, but others are on the way. A new die casting plant is going up in Grand Rapids, and a property for another one was bought in Pottstown, Pa.

The new plants, like the Toledo Plant No. 2, will be built with the objective of "quick change" in mind. Either military organizations or civilian customers can switch from the use of zinc to aluminum, magnesium or brass (or vice versa) with short notice to Doehler-Jarvis.

Laboratories Must Grow

A warning to industrialists against any plant expansion program that does not provide for research facility growth is issued by C. B. Wigton, president of Wigton-Abbott Corp., Plainfield, N. J. The engineering and contracting firm has been awarded a $2,250,000 contract for Continental Oil Co.'s air-conditioned research center in Ponca City, Okla.

Mr. Wigton says it would be unrealistic to allow any slow down in the search for new manufacturing techniques or new products until the international situation stabilizes. "Actually," he emphasizes, "the present threat to American institutions makes it vital to our long range security and progress that we continue to seek new sources of economic strength in newer and better industrial laboratories."

McAfee Laboratory Dedicated

Universal-Rundle Corp., New Castle, Pa., dedicated its W. Keith McAfee Laboratory, named for the firm's late board chairman, to be used for research in ceramics, metallurgy, chemistry and hydraulics. Facilities also include pilot plant equipment capable of duplicating any manufacturing process in the company's vitreous china and enameled cast iron plants.

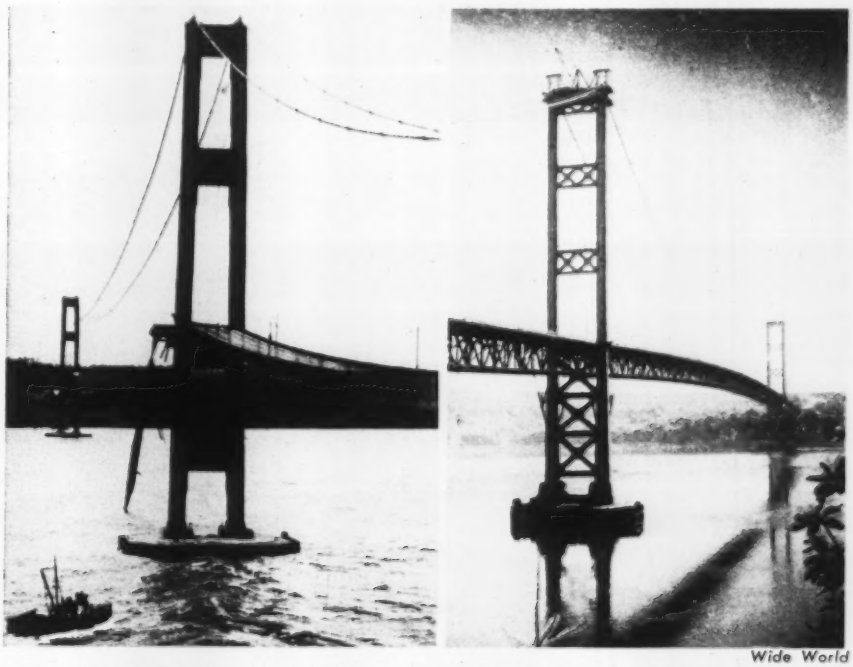
The brick and steel structure is two and one-half stories high and floor area measures 70 by 140 feet. It houses eight research units, a darkroom, library, offices and pilot plant area.

UCLA Spends $38 Million

A $38 million building expansion program at the University of California at Los Angeles puts UCLA at the top of the list of colleges and universities in the nation expanding their facilities.

Six major units are under construction and three more are scheduled to start this year.

Scheduled for completion by Feb. is a $1,660,000 law building. A $1 million art building will be finished by Nov., 1951. A $5 million chemistry-geology building is scheduled for completion by August, 1951.



Wide World

BRIDGING THE GAP: The old Tacoma, Wash., Narrows bridge (at left) fell on Nov. 7, 1940, during a 42-mile-an-hour gale. It has been replaced by the new $18 million Narrows bridge (at right). The new bridge, engineers say, is the forbear of a new type of suspension structure. It was opened to traffic this past weekend almost ten years after the Tacoma Narrows disaster

SEVEN STRONG REASONS

Appreciation of its many advantages explains the trend to N-A-X HIGH-TENSILE steel by manufacturers of commercial vehicles.

- HIGH STRENGTH
- HIGH FATIGUE RESISTANCE
- GOOD FORMABILITY
- FINER GRAIN STRUCTURE
- GREAT IMPACT TOUGHNESS
- EXCELLENT WELDABILITY
- HIGH CORROSION RESISTANCE

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—

N-A-X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division, Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

GM, Chrysler and Ford are hard hit by rising wage, nonferrous, pig iron and steel costs. They'll probably have to hike auto prices about $50 on 1951 models

DETROIT

THE BIG THREE automakers can't sit on the price lid much longer. Most of the independent producers have already hiked their prices; Studebaker is the latest with a $50 increase on each model of the 1951 Champion series. A good guess is that GM, Chrysler and Ford 1951 models will be marked up about $50, too.

The Big Three have not boosted prices since introduction of their 1950 entries. They have been able to keep the lid on thus far partly because of greater sales of deluxe models that carry price tags $75 to $100 higher than on standard cars. Deluxe sales can't carry the load alone.

Here's Why—All auto builders are bucking this kind of inflation: Copper has risen from 18.4 cents per pound in November, 1949, to 24.5 cents now; lead has jumped from 12.3 cents to 15.8; zinc from 9.8 cents to 17.5; tin from 89.8 cents to 106; aluminium from 17 cents to 19. Wages have gone up at least 10 cents an hour since last November for auto manufacturers. The increase will hit GM alone to the tune of $25 million annually. Foundry pig iron has gone up nearly $2 per ton since last November.

But the greatest threat of all to the automobile price structure is steel. At least 13 steel producers, including several large companies, have raised their quotations on one or more products. True, U. S. Steel subsidiaries have not yet taken the step, but the odds are that they will. Steel increases thus far range from $3 to $12 per ton. Boosts in other items are bringing the auto price pot to a boil.

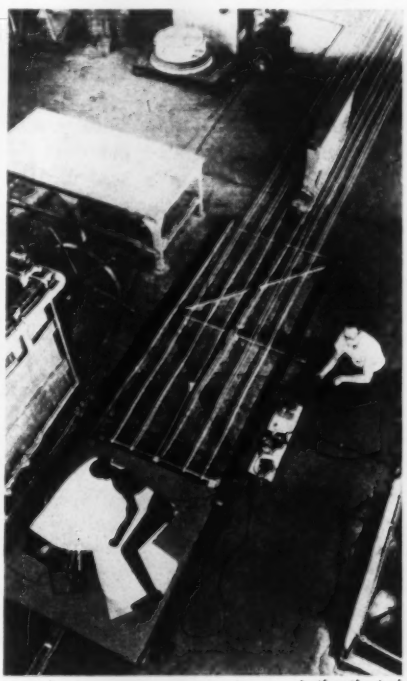
Too Hot—Independents who have already found the temperature too uncomfortable include Packard, Kaiser-Frazer, and Nash, besides Studebaker. Some of their price increases exceed $100. Nash points out that even its higher prices won't fully cover increases in cost to date. It hopes to make up the difference—as do all other car producers—by a sustained high volume of production. Sales of 1950 models, incidentally, soared about 41 per cent above the previous year.

Engineering Trucks Fleet-wise

"Ask the company that owns them" could well be a slogan of motor carriers now that they're seeking a greater voice in the engineering of trucks for fleet use.

In the move to increase their influence in the engineering and development of such trucks, the Regular Common Carrier Conference, an American Trucking Associations affiliate, created a committee to study motor carrier equipment "to determine best types, producing most profit a mile, for particular freight movements in particular areas."

Fleet operators are showing increasing interest in methods of improving new equipment, says Robert McBride, general manager of the conference.



Authenticated

THE THIN MAN: Cornell University's Aeronautical Laboratory in studying the kinematic behavior of the human body in crash decelerations uses an aluminum figure, known as the thin man. It duplicates the weight, proportions and specific gravity of the human body and assists researchers with a graphic picture of what happens when a human body is in an auto crash. Most fatalities and severe casualties are head injuries; so the major study is on the thin man's head. The laboratory hopes to supply information that may be used in the design of cars where such injuries will be reduced to a minimum

Roads Break Down Too Quickly

Gathering force is a drive on the next Congress to increase federal aid to highways to a flat $1 billion. The current figure is $450 million, to rise to $500 million in each of the two coming years.

The American Road Builders' Association says our highways continue to break down faster than they can be repaired, while new roads are urgently needed. Bureau of Public Roads points up the need by estimating at 48,484,000 the number of vehicles of all types that will be operating on our highways by end of 1950. That is an increase of 8.5 per cent, or 3,813,412 vehicles, over the record-breaking 44,670,588 registered at end of 1949.

Something New on Wheels

Don't be surprised if you see what appears to be a modified truck-trailer, minus the tractor, coming at you down the road. It may be a Fruehauf truck-trailer "souped up" with a motor by Twin Coach Co., Kent, O.

By modifying an engineless truck-trailer into a self-propelled cargo carrier, Twin Coach is now in the motor truck industry. The brain child of L. J. Fageol, president of Twin Coach, the new trucks are designated as Fageol Super Freighters. A number of orders for the new vehicle already have been received from leading truck lines.

Engine Is Down Under—Their design utilizes standard Fruehauf Trailers and was developed in co-operation with Fruehauf Trailer Co., Detroit. The Super Freighters will be powered by under-floor mounted Fageol Twin Coach engines and may be operated on either gasoline or propane. Under-floor location of the engine is made possible by its pancake design originally worked out for under-floor bus mounting.

In the front of the trailer are windshields and doors, steering wheel and other appurtenances for the driver.

Talking Points—Advantages claimed for the vehicle are big payload space, reduced weight, maneuverability, and lower investment and operating cost. By eliminating the truck unit the cargo carrier's overall length is 8 to 10 feet shorter than the conventional truck-trailer hook-

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up, and the weight is 5000 to 8000 pounds less, Mr. Fageol pointed out.

Experimental models of the Super Freighter have dual wheels in front and tandem axles in the rear. Steering problems presented by the dual wheels have been ingeniously overcome. A Vickers power steering unit is used; it is said to give maximum driving stability and handling ease at both high and low road speeds.

The Super Freighters can be built around a wide variety of trailer models and body types, Mr. Fageol says. These include refrigerator bodies, moving vans, livestock carriers, and regular cargo vans.

Willys Shipments Up

Reflecting the high rate of production in the automobile industry this year, Willys-Overland Motors Inc. shipped 8141 units in September to domestic dealers and for export. In that month of last year the total was 6430.

In the six months since Mar. 30 (when new models of civilian vehicles were introduced) Willys-Overland factory shipments totaled 51,198 units, compared with 41,388 vehicles in the corresponding six months a year ago.

'Better Buy—a Black Buick'

If you're in the market for a Buick do you know what color you're most apt to specify?

Black, probably. More Buick owners prefer black than any other color, says Albert H. Belfie, general sales manager of Buick. Production of black cars amounts to 19.1 per cent of total output. Olympic blue is second, accounting for 10.9 per cent.

Most black cars are sold in the East and Midwest. Buick buyers in the West favor pastels.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	846,972	678,092
September	744,982*	657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Sept. 23	188,451	158,518
Sept. 30	187,030	151,593
Oct. 7	179,698	148,443
Oct. 14	175,000	146,566

Estimates by Ward's Automotive Reports

* Preliminary.

Needed for Desert Travel

Four Wheel Drive Auto Co., Clintonville, Wis., received an order for 619 standard FWD trucks from the Egyptian ministry of war and marine for use in desert travel.

Tucker Cars, Good Will on Sale

The much publicized Tucker cars that never got onto the market are for sale at last. But not through sales channels customary in the auto industry.

They're being offered at public auction ordered by the United States District Court for the Northern District of Illinois, Eastern Division.

The sale is to be held by the Samuel L. Winternitz & Co., Chicago, a firm of auctioneers, liquidators, and appraisers, Oct. 18, 19 and 20 at the huge government-owned plant in Chicago where the Tucker Corp. had operating space.

Offered are Tucker Corp.'s good will; patents; dies; Tucker cars and auto parts; metalworking machinery; tool room, inspection, testing and shop equipment; and tool crib supplies and hardware.

Army Buying Up 500 Per Cent

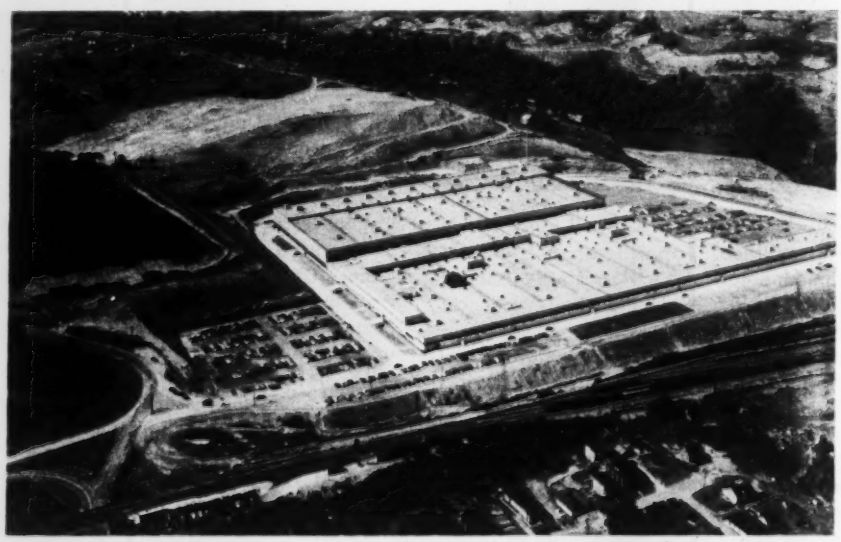
The Korean situation and the current increase in the size of the Army are responsible for a 500 per cent increase in procurement of "major items" for its combat and service troops, says the Department of the Army. Funds which the Army will spend in fiscal 1951 for equipment to be shipped to Atlantic Pact allies have been increased about 400 per cent.

The Army will spend about $2 billion in fiscal 1951 for guns, tanks, ammunition, armored vehicles and other materiel which constitute "major" equipment. The 500 per cent increase applies only to major items. Overall procurement by the Army will be four to five times greater in fiscal 1951 than the $2 billion rate of 1950. About $2.5 billion will be spent in fiscal 1951 for additional equipment destined for Atlantic Pact allies.

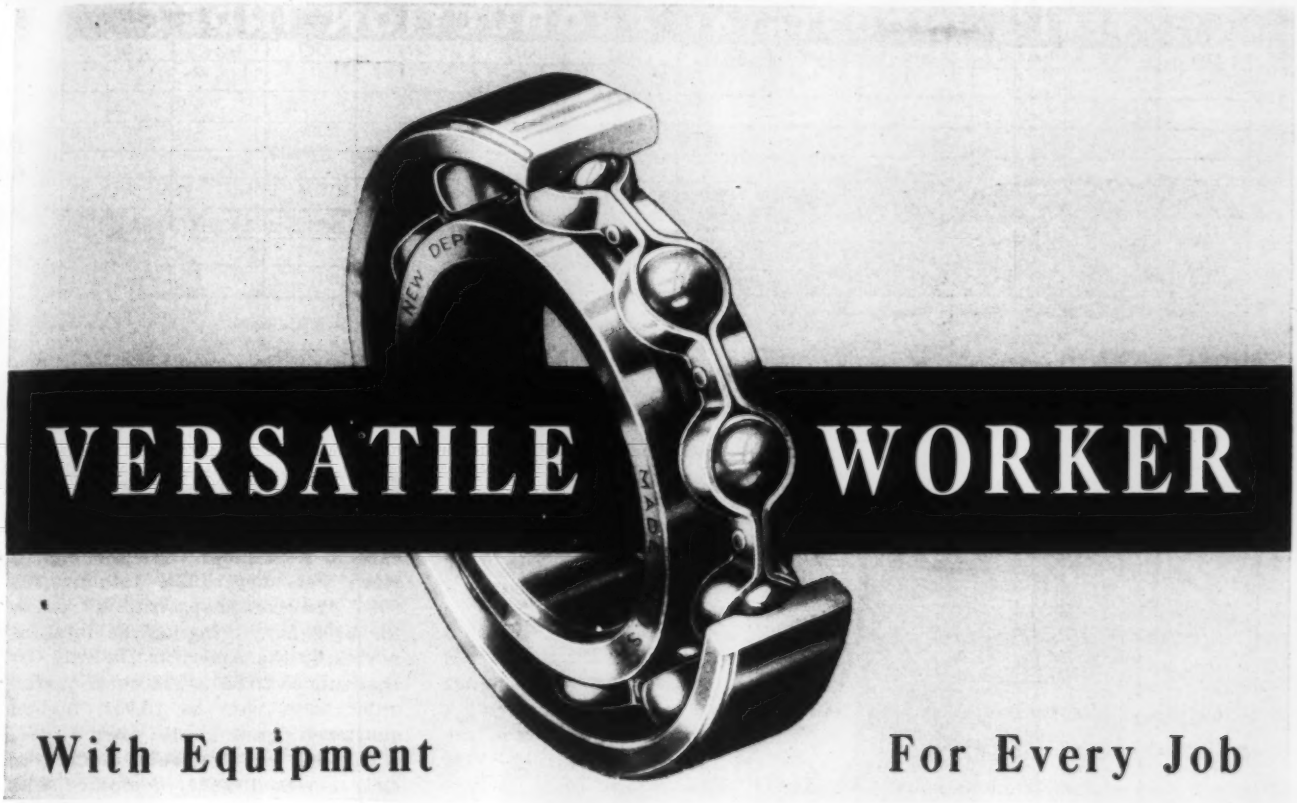
Army Ordnance Corps will spend 57.8 per cent of the total funds obligated in fiscal 1951, both for the Army's regular purchases and Atlantic Pact procurement. The Quartermaster Corps will use 15.4 per cent; Corps of Engineers 11.6 per cent; Signal Corps 6.16 per cent.

Standardization Forum Planned

To assist companies to organize their standardization work, American Standards Association is sponsoring a seminar Jan. 22-26. The seminar will consist of ten conferences, each comprising round-table discussions and a lecture by Dr. John Gaillard, mechanical engineer and lecturer at Columbia University. For details and registration write Dr. Gaillard at 400 W. 118th St., New York 27.



NESTLED IN THE HILLS: This is the Pittsburgh landmark that folks flying over western Pennsylvania will see. It's the large, ultra-modern stamping plant opened by Fisher Body Division of General Motors (STEEL, Oct. 9, p. 65). It provides the latest thing in machinery and equipment. It was laid out for the functional flow of materials



VERSATILE WORKER

With Equipment For Every Job

With shield on one side for protection against abrasive dirt.

With shields on both sides to keep dirt out and lubricant in.

With snap ring for location of bearing in housing.

With snap ring and either one or two shields as required.

With contact seals, lubricated for long life without attention.

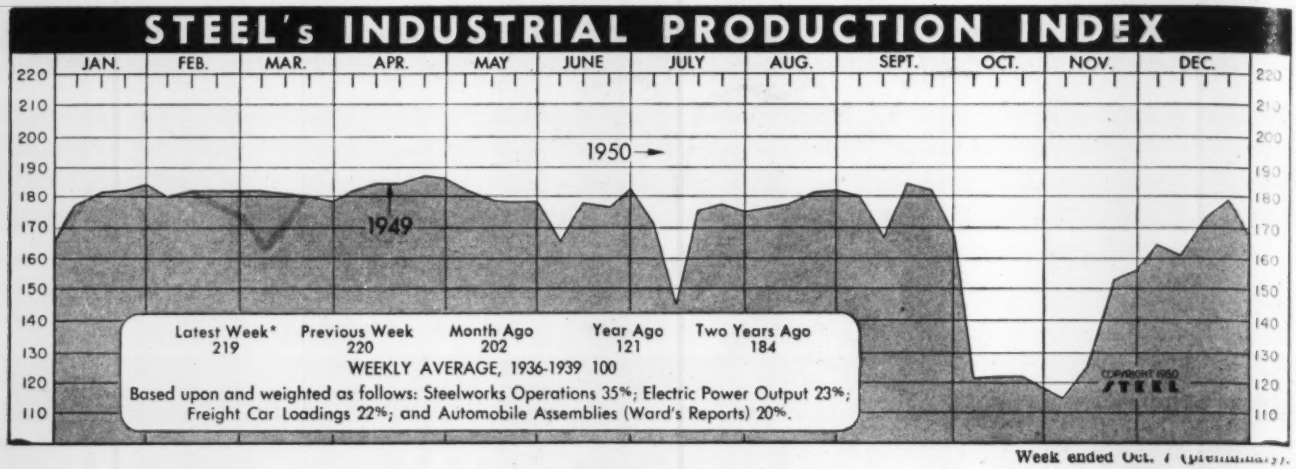
A standard New Departure single row ball bearing may be had with about a dozen different combinations of seals, shields, snap rings, etc., to simplify mounting, lubrication or enclosure—in short it may be had with the equipment to do each specific job best.

But basically you always have one of the most useful and dependable workers ever devised—taking radial loads and thrust loads from either direction—locating parts accurately and permanently -all in one unit requiring no time-wasting adjustment or other attention.

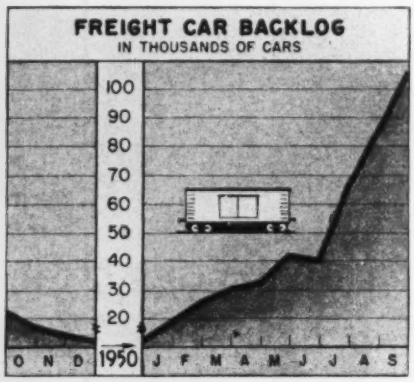
Nothing Rolls Like a Ball

NEW DEPARTURE BALL BEARINGS

NEW DEPARTURE · DIVISION OF GENERAL MOTORS · BRISTOL, CONNECTICUT 116


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 219
Previous Week 220
Month Ago 202
Year Ago 121
Two Years Ago 184
WEEKLY AVERAGE, 1936-1939 100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1950 STEEL

Week ended Oct. 7 (preliminary).



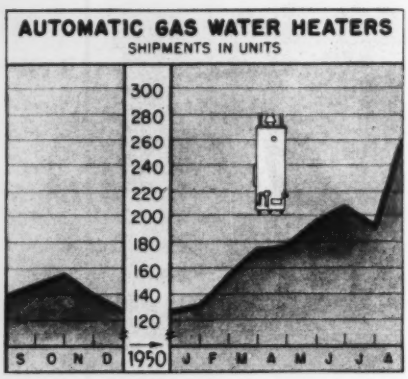
Charts—Copyright 1950, STEEL

Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1950	1949	1950	1949
Jan.	9,366	1,663	19,026	96,214
Feb.	9,075	332	26,055	85,974
Mar.	6,201	199	30,539	73,188
Apr.	3,308	30	32,857	52,569
May	11,636	589	42,300	52,281
June	2,095	153	40,585	42,813
July	30,065	408	67,084	36,564
Aug.	24,255	185	86,156	28,731
Sept.	25,611	123	106,611	22,203
Oct.	....	201	.....	17,377
Nov.	....	1,145	.....	14,146
Dec.	....	1,220	.....	12,036
Total	....	6,248		

*End of month.

American Railway Car Institute

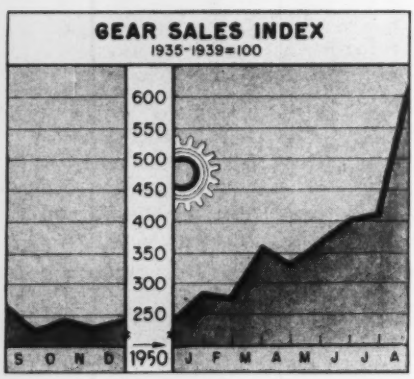


Automatic Gas Water Heaters

Shipments in Units

	1950	1949	1948
Jan.	131,600	88,400	126,600
Feb.	154,000	84,500	110,900
Mar.	172,800	106,000	131,600
Apr.	176,400	115,200	134,100
May	195,200	120,200	118,600
June	205,400	132,200	122,000
July	194,800	114,400	121,300
Aug.	264,000	138,800	160,200
Sept.	.....	147,300	149,300
Oct.	.....	154,200	127,500
Nov.	.....	138,300	109,000
Dec.	.....	126,500	88,900

Gas Appliance Mfrs. Assoc.



Gear Sales Index

1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	358.4	299.1	389.8
April	328.6	339.0	320.9
May	363.1	250.1	283.6
June	401.0	227.8	324.1
July	410.7	193.1	384.4
August	617.4	262.0	335.6
September	....	224.9	320.4
October	....	242.3	333.3
November	....	230.7	309.0
December	....	242.8	325.9

American Gear Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Sept.25	Ironers Sept.25	Refrigerators Sept.25
Durable Goods Sept.25	Machine Tools Oct.2	Steel Castings Aug.21
Employ., Metalwkg.Sept.18	Malleable Iron Oct.2	Steel Forgings.....Oct.9
Employ., Steel Sept.18	Price Indexes Oct.2	Steel Shipments ...Sept.25
Fab. Struc. Steel ...Oct.9	Purchasing Power ..Oct.2	Trucks, Elec. Ind...Jan.2
Foundry Equip. Oct.9	Radio, TV Aug.14	Vacuum Cleaners ..Oct.2
Gray Iron Cast. ...Oct.9	Ranges, Elec. Sept.25	Wages, Metalwkg..Sept.18
Indus. Prod. Oct.9	Ranges, Gas Oct.2	Washers Oct.9

Freight Car Orders Stay Up

Carbuilders' orders for new freight cars in September were the highest since February, 1924, totaling 19,908. Railroad shops received orders for 5703 cars bringing the total reported by the American Railway Car Institute to 25,611. The third quarter order total rose to 79,931, highest quarterly figure in 35 years.

Backlog of new cars ordered on Oct. 1 was 106,611, compared with 86,156 on Sept. 1 and 22,203 on Oct. 1, 1949. This is the largest backlog since November, 1948, and is divided with 71,173 being on carbuilders' books and 35,438 being placed with railroad shops.

Deliveries of domestic freight cars during September slipped slightly to 5131 from 5203 in August. In September, 1949, deliveries totaled 6141.

Water Heaters Hit New High

Automatic gas water heater shipments established a new peak in August as they totaled 264,000 units, the Gas Appliance Manufacturers Association reports. This is an increase of 90.2 per cent over the same month in 1949.

Shipments in the first eight months totaled 1,498,400 units and were 66.5 per cent higher than the 899,700 units shipped in the corresponding period a year ago. Compared with the prewar average (1936-1940) unit shipments in the first eight months this year were five times greater.

While shipments relating to eight-month shipments of electric storage water heaters were not available at the time the association made its tabulation, shipments during the first seven months totaled 556,600 units. They were 44 per cent higher than in the same period last year. During the same seven months, automatic gas storage water heaters totaled 1,234,400 units and were 62.2 per cent higher than a year earlier.

The Business Trend

Materials shortages and rising prices hold the center of the stage for metalworking. List of companies who haven't boosted prices dwindling rapidly

RAW materials and wage costs are rising in all segments of the metalworking industry dimming the slight chance that some manufacturers might be able to hold the price line. The Dutch boy with his finger in the dike was a fellow with a little to occupy his time when compared with executives trying to hold their prices down. After all he only had one hole to worry about.

A busy executive trying to scrounge enough materials to keep his production lines going even if he has to pay premium prices is more to be pitied than envied. As added diversions he has labor clamoring for wage hikes, the fear of incurring governmental displeasure if he boosts prices, occasional shortages dues to strikes at suppliers' plants, the prospect of more government directives and paperwork and higher taxes on current operations.

Though there are gripes production remains high despite all the difficulties besetting the businessman. In the week ended Oct. 7 STEEL's industrial production index was off only 1 point from the alltime high attained in the preceding two weeks at a preliminary 219 per cent of the 1936-1939 average. A drop of more than 7000 units in automotive assemblies offset improved performance in other index components.

Steelmaking Record . . .

Weekly steelmaking tonnages are higher than ever before recorded. Last week the ingot rate was about the same as in the week ended Oct. 7 when steelmaking furnaces operated at 101.5 per cent of theoretical capacity. At this rate the weekly tonnage yield is more than 1,952,000 net tons, highest in history. High production is a big reason why some steel companies have been able to hold prices steady while most other commodities climbed. Even record output isn't enough because an increasing number of steel producers have found it necessary to advance prices and the number of those holding firm is dwindling rapidly.

Auto Parts Shaky . . .

Increases granted to unions haven't solved all the problems for motor vehicle builders. Key vendors are still having contract problems and the shortages growing out of wildcat walkouts at key suppliers hold down output for the automotive industry. Outturn in the week ended Oct. 7 was 179,698 units, compared with 187,030 one week earlier. September's passenger car and truck assembly total is estimated at 744,982. It is about 100,000 units lower than August's 846,972 but easily tops the 651,826 units completed in September, 1949.

New Awards Peak . . .

Heavy engineering contract awards totaling $959.5 million in September resulted in several new records for the industry. The aggregate for the first three quarters reached $8964.4 million and smashed all previous 12-month records including those set in 1942. In the record wartime year

BAROMETERS of BUSINESS

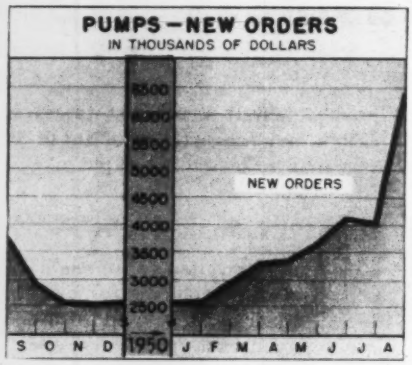
		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.5	101.0	98.5	7.5
	Electric Power Distributed (million kilowatt hours)	6,514	6,503	6,029	5,450
	Bituminous Coal Production (daily av.—1000 tons)	1,905	1,902	1,837	297
	Petroleum Production (daily av.—1000 bbl)	5,872	5,903	5,908	5,015
	Construction Volume (ENR—Unit $1,000,000)	$288.0	$244.8	$256.1	$152.4
	Automobile and Truck Output (Ward's—number units)	179,698	187,030	151,606	148,443
TRADE	Freight Car Loadings (unit—1000 cars)	882†	880	751	574
	Business Failures (Dun & Bradstreet, number)	154	148	145	182
	Money in Circulation (in millions of dollars)‡	$27,188	$27,060	$27,259	$27,476
	Department Store Sales (changes from like wk. a yr. ago)‡	+6%	+10%	+5%	−8%
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$17,035	$16,262	$12,793	$13,600
	Federal Gross Debt (billions)	$256.4	$256.8	$257.8	$256.6
	Bond Volume, NYSE (millions)	$23.9	$17.9	$13.4	$13.4
	Stocks Sales, NYSE (thousands of shares)	13,426	10,659	5,855	6,883
	Loans and Investments (billions)†	$68.8	$69.5	$68.6	$66.1
	United States Gov't. Obligations Held (millions)†	$33,845	$34,869	$35,082	$37,004
PRICES	STEEL's Weighted Finished Steel Price Index††	157.28	156.99	156.99	152.52
	STEEL's Nonferrous Metal Price Index‡	223.1	218.3	210.6	172.2
	All Commodities†	168.9	169.4	167.7	152.3
	Metals and Metal Products†	177.1	176.4	176.0	174.7

* Dates on request. † 1950 weekly capacity is 1,926,803 net tons. 1949 weekly capacity was 1,843,516 net tons.

† Preliminary. ‡ Federal Reserve Board.

† Member banks, Federal Reserve System.

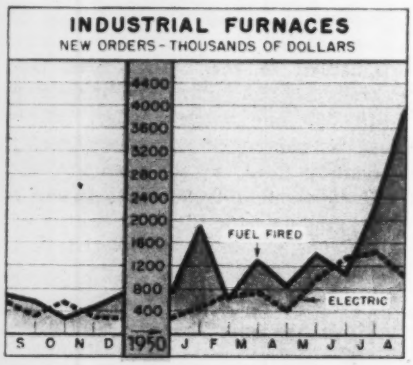
† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. †† 1935-1939=100.



Pumps, New Orders
In Thousands of Dollars

	1950	1949	1948
Jan.	2,586	3,390	3,819
Feb.	2,938	3,247	3,635
Mar.	3,313	3,593	4,703
Apr.	3,376	2,699	4,312
May	3,668	2,775	3,724
June	4,153	3,019	3,512
July	4,080	3,358	4,075
Aug.	6,429	3,767	4,520
Sept.	....	2,914	3,474
Oct.	....	2,539	3,571
Nov.	....	5,525	3,580
Dec.	....	2,560	4,263
Total	....	36,386	47,188

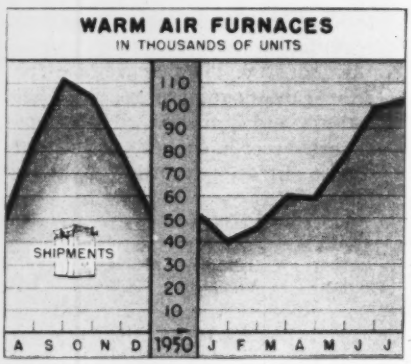
Hydraulic Institute



Industrial Furnaces
New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1950	1949	1950	1949
Jan.	1,914	1,047	473	948
Feb.	616	636	697	402
Mar.	1,299	305	753	436
Apr.	837	322	415	543
May	1,392	438	982	762
June	1,047	1,978	1,328	196
July	2,247	594	1,445	329
Aug.	3,927	706	1,039	589
Sept.	....	589	...	318
Oct.	....	269	...	565
Nov.	....	464	...	293
Dec.	....	718	...	281

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Warm Air Furnaces
Shipments in Units

	1950	1949	1948
Jan.	39,887	31,855	46,558
Feb.	45,618	33,125	36,345
Mar.	59,982	41,376	39,297
Apr.	58,798	34,595	45,597
May	78,349	42,427	55,473
June	98,517	55,857	64,724
July	102,304	48,551	57,292
Aug.	.....	84,250	92,011
Sept.	.....	111,582	103,566
Oct.	.....	102,989	107,024
Nov.	.....	78,828	77,498
Dec.	.....	51,766	51,163

Bureau of the Census

Charts—Copyright, 1950, STEEL

awards during the 12 months totaled $9306 million but $1300 of these were canceled by the War Production Board. This year's nine months total also is greater than in the like period in 1942 (ignoring later cancellations). September speedup in private industrial building also pushed volume for the year to a record $1131 million, topping previous full year marks. Awards in the first week in October were $288 million with industrial building maintaining its record pace at $64.4 million.

Carloadings Bigger . . .

Business moving at a record pace is pushing carloadings to the highest levels in two years. In the week ended Sept. 30 revenue freight loadings totaled 879,985 cars, an increase of 33.7 per cent over the corresponding week in 1949. Car shortages continue to plague shippers in many sections and no relief is in sight.

Prices Dip . . .

Wholesale prices dipped fractionally in the week ended Oct. 3 but the relief is only temporary. The Bureau of Labor Statistics index declined 0.3 per cent during the week to 168.9 per cent of the 1926 average from 169.4 one week earlier. The latest figure is 0.7 per cent above four weeks earlier and 10.5 per cent above the comparable week in 1949. The bureau estimates that its comprehensive monthly price index for September advanced about 2 per cent from the August level to about 169.5. All major groups advanced with the sharpest rises coming in textiles and chemicals.

Die Shops Are Buzzing

Capacity bigger than in 1939 but skilled help is a knotty problem for the industry

TOOL AND DIE shops are burning more midnight oil as order backlogs are at the highest level since May, 1947, the National Tool & Die Manufacturers Association says. Effect of defense orders is beginning to be felt but work for producers of civilian goods is still the industry's bread and butter.

Some tool and die shop owners express surprise at how slowly defense orders are coming through but they say there is a pickup in inquiries from prime contractors on defense contracts. They will be the first to feel any surge in defense work because essential tooling must precede production.

No Rush, No Roar—One area in which order placement falls short of expectations is for aircraft work. Those who expected the aircraft program to start with a rush and the sky to be filled with the roar of military aircraft find they did not take into account a number of hurdles. Early expectations were that there would be a large amount of tooling for additional production lines to parallel those already in operation. This die work is forthcoming but not for several months. Current production increases are accommodated by speedup of existing lines and working longer hours.

More Muscle—Capacity in the contract tool and die industry is three times what it was in 1939. The industry's 2500 shops employ 45,000 workers and this year will produce tools valued at $325 million. Machinery replacements also raise the industry's potential to a higher level than in World War II.

Manpower is even more of a problem than in some other metalworking industries. Qualified tool and die makers looking for jobs are as extinct as the dinosaur. Training a journeyman usually takes from 4 to 5 years of apprenticeship and in some highly specialized fields such as die sinkers as much as seven years' training is needed.

In the early days of World War II contract shops met metalworking's need only by logging many hours of overtime. Today they are worried because Selective Service has taken no action in recognizing the Labor Department's list of critical occupations.

Local boards have the right to grant deferments for the nation's welfare but so far the boards have

played it safe and some top-flight young journeymen are being drafted.

Foote Bros. Refinancing

Foote Bros. Gear & Machine Corp., Chicago, plans a refinancing program pending stockholder approval to enable the company to enlarge its operations. Increased demand for its products and services in both the industrial and precision gear divisions requires the financing of necessary inventories at a much higher level than those maintained during the past several years, President W. A. Barr states in a special letter to stockholders. Unfilled orders for the company's products now total $9.5 million; are approximately double the total a year ago and the highest since the end of World War II.

A special meeting will be held Oct. 24 to authorize the sale of $2 million first mortgage 4 per cent sinking fund bonds due in 10 years. Company will use $520,000 to retire the balance of a $1.2 million mortgage bond issue sold in 1947 and the remainder will be required for additional working capital.

Textile Bearings Roll

Antifriction bearing equipment sales for textile machinery are the highest in history for SKF Industries Inc., Philadelphia, says R. H. DeMott, vice president. Incoming orders for roller bearing spindle bolsters during the first eight months were about 50 per cent higher than a year ago, while orders for tape tension pulleys are expected to exceed those for any previous year. SKF is a major supplier of bolsters and pulleys which are essential in obtaining a uniform twist in the spinning of cotton and synthetic fibers.

Exceptionally strong demand for equipment that turns on ball and roller bearings reflects the textile industry's vigorous drive to improve its economic position by producing more and better goods at lower cost, Mr. DeMott explains. The broad expansion and modernization program should continue for some time, he believes, because of the large amount of obsolete machines still in use.

Record Rate for Incomes

Personal income ran at a $223.4 billion record rate in August. It was $2.7 billion higher than the July pace, the Commerce Department says.

Practically all the gain was in wages and salaries which were $2.6 billion above July on an annual basis. Commerce says this reflects a rise of 1 million persons employed to a civilian employment total of 62.4 million in August. The employment increase was one of the largest monthly gains on record.

Armco Awards Contracts

Armco Steel Corp. awarded a contract to the Chemical Plants Division of Blaw-Knox Co., Pittsburgh, for construction of building additions at Zanesville, O.

Armco's hot mill building will have an addition of 100 x 260 feet, and the annealing building will have an addition of 87 x 108 feet. Both additions will be of one-story construction.

Housing Credit Tightens

New home construction will be a smaller factor in high level business activity next year. New curbs on housing credit imposed by the government last week are aimed at cutting the building pace from the current 1.3 million yearly to not more than 800,000.

Nonveterans' cash down payments required on new construction now range from 10 per cent on houses costing less than $5000 to 50 per cent on dwellings priced from $24,250 up. Veterans down payments run from 5 per cent to 45 per cent. In announcing the new credit terms the Federal Reserve Board did not explain where new homes costing less than $5000 were available.

Controls apply only to one and two family houses. They do not apply to apartment projects, store or factory construction for which other regulations are being prepared.

All mortgages issued under terms of the government's Regulation X must be paid off in 20 years. The single exception covers those placed on houses valued below $7000 in which cases the amortization is extended to 25 years. Formerly mortgages up to 30 years were readily available.

TV Manufacturers Enjoy Mounting Sales

TELEVISION'S rapid growth is getting extra help from buying aimed at beating possible shortages and at getting in under the wire before the new 10 per cent tax goes into effect. How much effect these two factors have on sales is largely guesswork as technological improvements, better programming and the growing coaxial cable also are big reasons for TV's growth.

September's production opened at record levels and the total for the month should be near the alltime monthly high of 702,287 sets produced in August. This total wipes out the old record set in March when 643,000 sets were produced in a five-week reporting period, Radio-Television Manufacturers Association tabulation shows. The August report covers only a four week period.

Lusty Infant—Future sales progress for the television industry is a matter of conjecture because of its newness. New areas reached by television will open up after the Federal Communication Commission's freeze order on new stations is dissolved next spring.

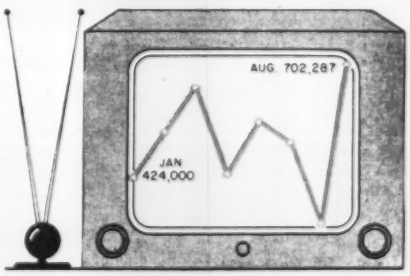
Another problem still not totally resolved is that of color television. Although the Columbia Broadcasting System's method won tentative approval at FCC hearings, other companies petitioned the commission for further consideration of this important question. When color television wins final acceptance in one form or another there will be some modification required in many sets already installed and probably a buying wave to get the newest and latest thing.

Up and Up—Since January when 424,000 sets were produced the output curve has been generally heading upward except that no other month prior to August matched the total reached in the five-week March period. July, of course, dropped to 330,315 sets from 522,000 a month earlier due to mass vacations.

While television has prospered, radio confounds many would-be experts and enjoys a mild boom all its own. In the first eight months this year 4,850,402 home radio sets, 2,615,985 auto radios and 1,284,578 portables were sold. RTMA estimates that $700 million worth of TV sets and $210 million worth of radio sets were sold in the first eight months, topping sales for all of 1949.

Output Picture Gets Bigger

. . . runs counter to seasonal trends



Men of Industry

A. R. Kelso was elected vice president, **Mack Trucks Inc.,** New York, and vice president and a director of Mack Mfg. Corp., subsidiary. In his new position he is in charge of manufacturing and production at all Mack plants. He makes his headquarters at Allentown, Pa., site of the company's main assembly plant. Mr. Kelso joined Mack early this year as production counselor. **S. S. Stewart** was named vice president in charge of purchasing for the subsidiary company. He was purchasing agent for the manufacturing division of Air Reduction Sales Co.

Carboloy Co. Inc., Detroit, appointed **H. H. Jason** manager of tool sales and **J. D. Kennedy,** manager, wear parts sales.

R. H. Wright was named general superintendent, **Atlantic Steel Co.,** Atlanta. **R. E. Bobbitt** was named superintendent of maintenance, and **W. R. Potts** was named chief engineer.

Carl W. Nedderman, for 15 years affiliated with metalworking industries in an executive capacity, was elected assistant vice president of **Edward Valves Inc.,** East Chicago, Ind. He joined the company in 1948 and previously was president and general manager, Universal Camshaft Co., and controller of Muskegon Motor Specialties Co., both of Muskegon, Mich.

D. W. Holmes, for four years general sales manager, **Parker Appliance Co.,** Cleveland, was elected vice president in charge of sales. He had been with Weatherhead Co., Cleveland, where he held the successive posts of assistant to the president, general manager of the Columbia City, Ind., plant, and sales manager.

FRED P. BIGGS
. . . Brake Shoe & Castings Div. president

STEPHEN S. CONWAY
. . . V. P.-sales, Brake Shoe and Southern Wheel

Fred P. Biggs was appointed president, Brake Shoe & Castings Division, and **Stephen S. Conway** vice president in charge of sales, Brake Shoe & Castings and Southern Wheel Division, **American Brake Shoe Co.,** New York. Mr. Biggs was named vice president in charge of sales of both divisions in 1944, becoming first vice president of the brake shoe division in 1948.

P. J. Gallagher was appointed general sales manager, **Hinderliter Tool Co.,** division of H. K. Porter Co. Inc. He will have headquarters at the company's main office and factory in Tulsa, Okla.

Edmond A. Neal was appointed domestic sales manager, **Nicholson File Co.,** Providence, R. I. He joined the company in 1939, and after completion of its training course for representatives in the Providence factory, was assigned to the Philadelphia and New York areas. In 1945 he returned to the home office and was subsequently made assistant director of sales. Mr. Neal succeeds **Harry L. Whitney,** who resigned as director of sales in September.

Appointments in the Cleveland district, **Republic Steel Corp.,** include: **R. P. Liggett,** chairman of Republic's blast furnace committee, was given additional duties as general superintendent of blast furnaces. He held a similar post at the Buffalo district steel plant for the last 12 years. **J. M. Komp** was named general superintendent of the coke plant, and also will direct the smoke-abatement campaign in the coke plant in conjunction with Republic's program to alleviate the smoke problem in the Cuyahoga valley. **G. N. Harmon** is the new assistant general superintendent of the 98-inch strip mill, and replaces **W. E. Boger,** resigned. **C. A. Tarter** was appointed to succeed Mr. Harmon as

D. W. HOLMES
. . . Parker Appliance vice president-sales

EDMOND A. NEAL
. . . domestic sales mgr., Nicholson File

R. P. LIGGETT
. . . Republic supt. blast furnaces, Cleveland

SUNOCO WAY LUBRICANT
Chosen Over All Others For
WORLD'S LARGEST MILLING MACHINE

The milling machine shown below—the largest in the world, according to its builder—will soon be producing main spars for turbojet planes. The length of the ways and the weight of the table of this mammoth precision-built machine tool make its lubrication a real problem. To hold tolerances and avoid enormous refinishing expenses, the oil must support the table evenly and lubricate the ways perfectly.

To meet such requirements, the way lubricant must combine many qualities. It must be an oil with extreme pressure characteristics, metalwetting capacity, and adhesiveness, so as not to squeeze out under heavy loads; it must flow freely, prevent "stick-slip action" of the table, and successfully resist rusting.

An oil that can meet all those requirements is exceptional. So it is significant that after extensive comparative tests the machine tool builder selected Sunoco Way Lubricant and recommends its exclusive use on the ways of this costly miller. He knows this "Job Proved" Sun product protects his reputation as well as the big investment in time, money, designing skills, craftsmanship.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
In Canada: Sun Oil Company, Ltd., Toronto and Montreal

Overall length: 105 ft. Bed length: 90 ft.
Weight: Approximately 120,000 lbs.
Maximum travel length of carriage: 80 ft.
200 H.P. in carriage through 4 cutter head motors.
Automatic horizontal swarfing to 10° off horizontal.
Automatic vertical swarfing to 15° off vertical.
Thymotrol variable feed. Automatic chip disposal.

Manufacturer:
Onsrud Machine Works, Inc., Chicago, Ill.

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

superintendent of the 98-inch cold strip mill and cold strip finishing department.

Atlas Steels Ltd., Welland, Ont., Canada, appointed **Edward P. Geary**

EDWARD P. GEARY
. . . exec. vice president at Atlas Steels

executive vice president. He has been a vice president and general sales manager since 1947. Before joining Atlas Steels he was assistant vice president in charge of sales for Rustless Iron & Steel Corp., Baltimore.

J. K. Sutherland was reappointed sales manager, **Diamond Machine Tool Co.**, Los Angeles.

Corbin H. Myers was appointed superintendent of industrial engineering at the Torrance, Calif., plant of **National Supply Co. David M. Sowle** was made superintendent of industrial relations, also at Torrance.

Leonard N. Goodell was made assistant to **Westinghouse Electric Corp.'s** Pacific Coast district manager, **Joseph R. McGilvray**, at Sunnyvale, Calif. Mr. Goodell formerly was manager of the manufacturing and repair department at the company's Chicago plant. **Carl F. Herbold** was appointed director of manufacturing planning at the company's small motor division at Lima, O.

Carl E. Scholz was appointed vice president and chief engineer of All America Cables & Radio Inc. and Commercial Cable Co., **American Cable & Radio Corp.**, New York.

Edmund C. Schorr was named assistant manager of sales, specialty transformer and ballast divisions at Ft. Wayne, Ind., for **General Electric Co. Constantine L. Chase** was appointed a sales development supervisor in the phenolic products sales section, Pittsfield, Mass. **L. M. Larkin** was named western sales manager of GE's air conditioning department.

Cooper Alloy Foundry Co., Hillside, N. J., appointed **William C. Hookway Jr.** assistant to the chief engineer. He was sales representative for the northern New Jersey area and is succeeded in that territory by **James Ziegler**, presently sales representative of Pittsburgh-Cleveland district. Before joining Cooper Alloy Mr. Hookway was with H. A. Wilson Co.

Lloyd C. Smith Jr., recently associated with **Atkins & Co.**, Indianapolis, will represent that company in Wisconsin, Iowa and western Michigan, with headquarters in Milwaukee. **W. N. Springer Jr.** will serve the eastern Michigan area as a representative, with headquarters in Detroit.

Paul W. Sommer was elected vice president, **Keystone Steel & Wire Co.**,

PAUL W. SOMMER
. . . vice president at Keystone Steel & Wire

Peoria, Ill. Last year he was elected assistant treasurer of the firm. He is on the board of directors of two Keystone subsidiaries, National Lock Co., Rockford, Ill., and Wire Specialties Co., San Jose, Calif.

Erie Forge Co., Erie, Pa., appointed **J. D. Campbell** general superintendent of construction, maintenance and repairs.

New directors elected to the board of **Kaiser Steel Corp.**, Oakland, Calif., are **J. L. Ashby**, vice president and general manager; **Edgar F. Kaiser**, president, Kaiser-Frazer Corp.; **George D. Woods**, First Boston Corp.; **S. H. Husbands**, president, Transamerica Corp.; **George W. Burpee**, partner of Coverdale & Colpitts; and **Henry J. Kaiser Jr.**

Appointed to the metallurgical staff, **Columbia Steel Co.**, West Coast subsidiary, U. S. Steel Corp., are: **R. A. Schaus**, named metallurgical engineer in charge of alloy, stainless and tubular products; **B. W. Buist**, appointed senior service metallurgist, southern division, and **D. C. Wilde**, named service metallurgist.

George H. Main was assigned as a sales representative to the Buffalo district office, **Allis-Chalmers Mfg. Co.** Representatives assigned to offices in the midwest region are **Joseph Pukac**, Milwaukee; **Frederick Barbian**, Omaha, Nebr., and **Carl R. Hall**, Kansas City.

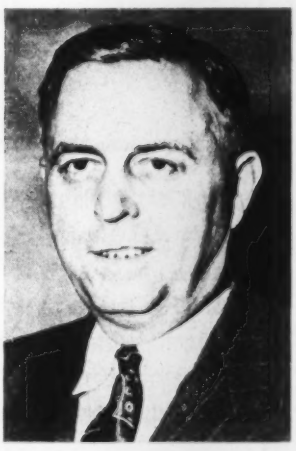
Earl Lewis was promoted to advertising manager, **Ekco Products Co.**, Chicago.

Charles A. Rossiter was promoted to sales manager of **Arthur S. La Pine & Co.**, Chicago.

Henry A. Federa was elected secretary, general attorney and a director of **Orinoco Mining Co.**, subsidiary, U. S. Steel Corp., Pittsburgh. He formerly was an attorney for U. S. Steel Corp. of Delaware.

Walter F. Craig Jr. joined **Climax Molybdenum Co.** as metallurgical engineer in the Chicago office. He was supervisor, ferrous metals research, at Armour Research Foundation.

Heyl & Patterson Inc., Pittsburgh, appointed **H. G. Dillon** vice president in charge of sales and **B. A. Rose** vice president in charge of engineering. For the last four years Mr. Dillon was sales manager. Mr. Rose was



H. G. DILLON
. . . Heyl & Patterson vice president-sales

director of engineering. **E. W. Kahle** was promoted from assistant treasurer to treasurer. **E. E. Bauer** was appointed contract engineer for the company and will serve the steel and utility market in the western territory. He

FRANK E. WALLING
. . . Quebec Iron & Titanium gen. mgr.

ROBERT F. GOLDEN
. . . works mgr., Reliance Div., Eaton Mfg.

DONALD R. SMITH
. . . mgr. special products, Ironton Fire Brick

formerly was central district manager in Chicago for Peerless Pump Co.

Frank E. Walling was appointed general manager in charge of Canadian operations for **Quebec Iron & Titanium Corp.,** subsidiary of Kennecott Copper Corp. and New Jersey Zinc Co., New York. He succeeds **A. H. Robertson,** who was in charge of the first exploration in the Allard lake district of Quebec and has since been in charge of the construction program of the company. Mr. Robertson now resumes his position as vice president and general manager, Kennco Explorations Ltd., also a Kennecott subsidiary.

Acheson Colloids Corp., Port Huron, Mich., appointed **Paul L. Eness,** reseach engineer, to the staff of its product development laboratory to succeed **D. G. Weaver,** transferred to the company's offices in Newark, N. J. Mr. Eness was engaged as a research chemist on organic materials at Battelle Memorial Institute, Columbus, O.

Robert F. Golden was appointed works manager, Reliance Division, **Eaton Mfg. Co.,** Massillon, O. **C. A. Sellen** was named assistant to the general manager of the division. He was chief metallurgist of the division, which he joined in 1939. Mr. Golden joined Reliance in 1946 and has since devoted his time to development and research. He previously was with National Lock Washer Co., Newark, N. J.

John F. Muldoon, formerly assistant to the president, St. Louis Car Co., St. Louis, joined **Price Iron & Steel Co.,** Chicago, as vice president.

Oscar von Seeger, export representative, was named to the new post of assistant divisional manager, export sales department, **Caterpillar Tractor Co.,** Peoria, Ill.

George Gabriel, plant engineer at the Mertztown, Pa., plant of **Atlas Mineral Products Co.,** was promoted to assistant plant manager.

Donald R. Smith was appointed manager, special products division, **Ironton Fire Brick Co.,** Ironton, O. He joined the company in 1941. In 1943 he joined the Navy and after discharge entered Ohio State University where he received his degree in ceramic engineering.

Bernard I. Raysor was appointed manager of the **Harrison Radiator Division** plant in Buffalo, General Motors Corp. He succeeds **Bernard L. Howe,** promoted to manager of Harrison's plant in West Lockport, N. Y.

Chester M. Brown was elected vice president, general chemical division, **Allied Chemical & Dye Corp.,** New York. For the last 21 years he held various positions in the production and sales departments of the company, and for the last three years was director of sales. **F. Harris Nichols** retires as vice president, a position he has held for the last 24 years. He was associated with the company over 50 years.

OBITUARIES...

Claude D. Eiler, 55, president, **Crescent Truck Co.,** Lebanon, Pa., died Sept. 28. He had been associated with Crescent since 1921 as chief draftsman, chief engineer, treasurer and general manager, and held the position of president since 1946.

Dr. Willis H. Carrier, 73, pioneer in air conditioning, and founder of **Carrier Corp.,** Syracuse, N. Y., died in New York, Oct. 7. He was president of Carrier until 1931 when he became chairman of the board, serving in that position until 1943.

Arelin L. Wagoner, 65, retired in April as purchasing agent, steel and steel products, **General Electric Co.,** Schenectady, N. Y., died Sept. 28.

Earle S. Henningsen, 60, who was to retire Oct. 1 as manager of engineering at **General Electric Co.'s** large motor and generator divisions, Schenectady, N. Y., died Sept. 23 after a brief illness.

Winslow S. Pierce Jr., 56, president, **Split Ball Bearing Corp.,** Lebanon, N. H., died Oct. 5 at his summer home in Bayville, L. I. He also was president, Miniature Precision Bearing Corp., Keene, N. H.

J. A. Horne, 81, chairman of the board of **Yale & Towne Mfg. Co.,** New York, died at his home in Stamford, Conn., Oct. 3. He became acting president during World War I, was vice president in charge of production from 1920 to 1943, and since 1943 served as board chairman.

Joseph C. Bean, 73, who had served as a manufacturers' representative for **Parkin Chemical Co.,** Pittsburgh, and **Heil Process Equipment Corp.,** Cleveland, died Sept. 22 in Warren, O. He had served as a superintendent of the hot strip mill of the former Trumbull Steel Co. at Warren, and as superintendent, American Tube & Stamping Co., Bridgeport, Conn.

Walter H. Watson, 89, one of the founders of **Watson Elevator Co.,** New York, died at his home in Northvale, N. J., Oct. 3.

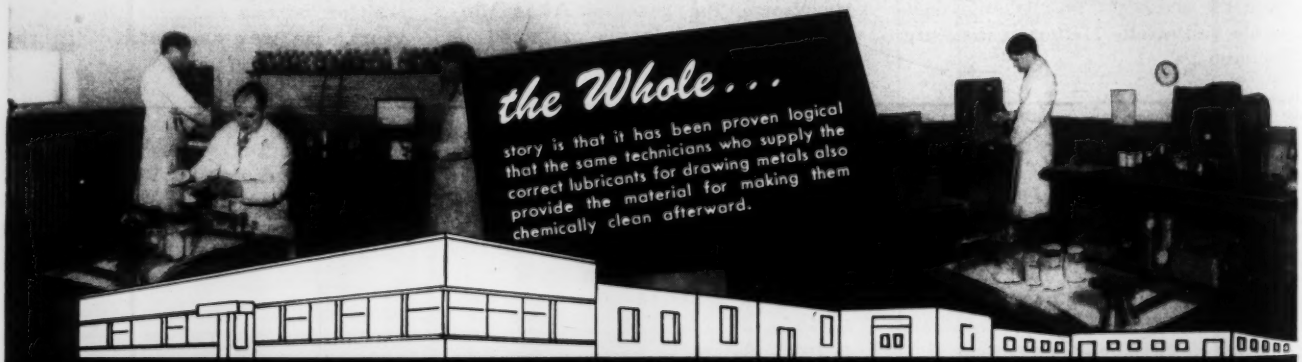
FLUID-FILM was designed for STEEL STAMPING . . . regardless of size, depth of draw, radii, etc. —If it can be done with a pigmented compound, it can be done to advantage with non-pigmented FLUID-FILM—and a little of it goes a long way . . . FLUID-FILM U-19 is what we recommend for steel. Readily applied as is, or it may be diluted with water or oil up to two parts of diluent to one of compound . . . FLUID-FILM is rust inhibited and is easily applied—rolled, dipped or sprayed —weld through it, anneal it—obtain a perfect job without precleaning and with practically no residue . . .

HALF *fluid-film*

the other

HALF *metal cleaner*

Clean STEEL STAMPINGS, drawn with FLUID-FILM, by immersion in the inset plant proven Steel Cleaner, especially developed for this purpose, NORTHWEST Metal Cleaner No. 78 . . . Normal concentrations of from six to eight ounces per gallon does the job rapidly and efficiently—its long life makes it economical . . . Equally adaptable for cleaning steel parts by immersion prior to plating, bonderizing, painting or vitreous enameling . . . A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .



the Whole . . .

story is that it has been proven logical that the same technicians who supply the correct lubricants for drawing metals also provide the material for making them chemically clean afterward.

NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.

. . . serving you since '32

Production AND Engineering
NEWS AT A GLANCE

TOOL WITH DIFFERENT SHAPE— New tool design principle developed by Speed Bits, Cleveland, provides a tool bit that has two cutting sides and chip breakers the full length of the edges to give any desired side clearance and side rake angles. As the tool wears only one flat grind, the face of the tool bit maintains the correct side clearance, front clearance, end-cutting edge, side cutting edge and side rake angles. Chatter and vibration also is eliminated by a self-seating and locking feature that locks the cutting tool to all four sides of a square or rectangular tool holder channel.

"ELBOW ROOM" OF ATOM MEASURED— Using supersensitive radar techniques, scientists now can determine an atom's "elbow room"—actual spacing between atoms in a molecule—to within a millionth of a millionth of an inch. Dr. William E. Good, physicist at the Westinghouse Research lab, Pittsburgh, says the new instrument which now is primarily a laboratory tool, reveals important new facts about the position of atoms and their chemical and electrical behavior. Called a "microwave spectroscope" the device beams ultra-short waves through gas molecules and "tunes in" on the vibrations of individual atoms.

LIGHT-ACTUATED VALVE— Among the scientific phenomena investigated during World War II which are now coming into important applications in industry and in further scientific use is the effect of infrared light on germanium. A tiny piece of germanium, when properly prepared and placed in contact with a pointed fine wire many be used as a light-actuated valve to control the flow of an electric current. Such a device, called a germanium photocell, is of three types. According to George D. O'Neill of Sylvania Electric, one of these, the photoresistance cell is able to produce electric signals at least as great as 25 volts when a light shining on the cell is modulated. Current response of another type, the photoconductance cell, is so large that it can be used to operate relays.

CHROME PLATING HELPS GAGES— Among various comparatively new applications of electroplating in the automotive industry is the extensive use of chromium plate on its plug gages and other measuring tools that are subject to excessive wear. The American Electroplaters' Society points out that fatigue life of plug gages is increased more than 100 per cent after plating.

ANNEALING TIP— If you have a special heating problem, perhaps you can profit from a stress relief annealing technique used by General Electric on turbine parts. Method involves use of a Calrod tubular heater and a standard 400-ampere portable welding unit equipped with a heat pyrometer and controls. Arrangement is capable of heating to approximately 1500° F. In the GE application, the tubular heater was first wrapped around the part to be annealed. The section then was packed in asbestos to confine the heat and wired to the welder. By manipulating the welder controls, it was possible to regulate the temperature accurately—increasing it 30° every 15 minutes. After the section was heated to 1300° F and held there for two hours, the heat was reduced by 30-degree steps, the section finally air-cooling after dropping to 600° F.

1950 Metal Show

Next week in Chicago, Oct. 23-27, four great societies, American Society for Metals, American Welding Society, Metals Division of AIME and Society for Non-Destructive Testing, plan to be hosts to more than 30,000 top management, production and engineering metalworking industry talent in what promises to be the most important National Metal Congress and Exposition since the end of World War II.

Underlying theme of the 32nd annual metal show, is high production in an emergency. All societies as well as several hundred manufacturers showing their products and services at the International Amphitheatre will provide many and varied opportunities to aid show attenders obtain new ideas and shortcuts that will help them step up production quickly in event of total war.

STEEL, this week, devotes a large share of its production and engineering section, beginning on p. 102, to metal show activities in order to make it easier for you to plan your information gathering campaign.

In referring to the programs of the several societies, p. 108, you will find many current subjects on metallurgy, welding and various techniques for production testing. An important high-spot of the week is the ASM business forum, planned and arranged by Earl L. Shaner, editor-in-chief of STEEL. Scheduled to take place Thursday, Oct. 26, at the Palmer House, it will afford top-notch executives of the metalworking industries an opportunity to explain how their companies are geared into the nation's defense program.

If you are interested in seeing who is going to be at the show take a look at the exhibitor's list, p. 124. On p. 106, Guy Hubbard tells you what to look for at the show. Art Allen, p. 102, relates the part research plays in industry in making tomorrow's profits.

Self-Regulating Chromium Bath Plates 20 to 80% Faster

New type solution steps up plating production on existing equipment; provides power savings as high as 30 per cent

By A. H. ALLEN
Detroit Editor, STEEL

CHROMIUM plating techniques, basically unchanged in 20 years, are feeling the impact of a new type solution which cuts plating time 20 to 80 per cent and improves cathode efficiencies 20 to 50 per cent. This means much higher production from existing equipment using possibly 30 per cent less power.

The self-regulating high-speed (SRHS) chromium bath developed by research technicians of United Chromium Inc., New York, has seen steady increase in acceptance, particularly in the last few months. Thus, as of Sept. 1, there were some 350 plants in the country which had changed to the new solution. Many of these represent large installations, of the 2000-5000 gallon type. They cover a wide range of products in varied industries, and include decorative plating and "hard" and chrome applications.

Saves Time, Money—With a large aircraft and military equipment production program imminent, some phases of which require chromium plating (hard chrome plating of piston rings, for example), there are obvious advantages, time-wise and economy-wise, in a plating technique of this sort.

The conventional type of chrome solution since 1925 has been a mixture of chromic acid (CrO_3), 30-50 oz per gal, and sulphuric acid (H_2SO_4), 0.3-0.5 oz per gal, or an equivalent amount of soluble sulphate in such concentration that the ratio of CrO_3:SO_4 is about 100. Temperature range in operation varies from 100 to 160° F, with current densities 60-500 amp per square foot. Temperature and current density are related to give a cathode efficiency of about 12 per cent for bright deposits and 16 per cent for hard deposits. Current density must be increased as temperatures are raised and must be slightly higher for hard plating.

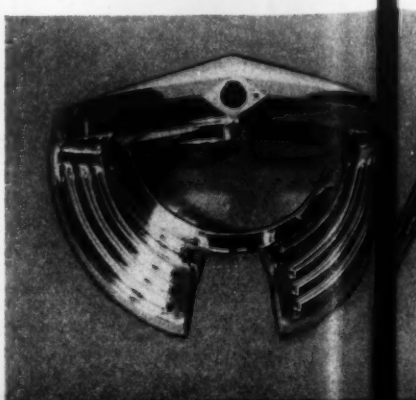
Hard coatings are relatively thicker than the "flash" type decorative plate, being applied directly to the base metal and ranging from 0.0003-0.010-inch. Decorative coatings on steel are usually applied over base layers of nickel or nickel and copper. Thickness is only 0.00001-0.00005-inch. A recent technique employed widely in the automotive industry is the use of this type of "flash" chrome on stainless steel moldings to obtain a perfect match with other chrome parts.

"Automatic" Catalyst Used—Observed shortcomings of conventional chromium baths include their relatively low cathode current efficiencies (12-16 per cent as noted), poor covering power, narrow plating range and the need for close control of the bath balance. It was to overcome these drawbacks that studies were initiated on solution additives and other changes.

Upshot of the extended research was the perfection of the SRHS solutions which are "chromic acid solutions with mixed and co-operating acid catalyst radicals in automatically controlled concentration." The catalyst-bearing salts are added to the solution in dry form, the catalyst itself being "automatic" by virtue of its solubility characteristics, thus keeping the bath Baume at the selected value. There are two common types of solutions, one maintained at 21° Baume, the other at 31° Baume. The bath is a continuously saturated solution, with excess catalyst available to keep it that way.

The solutions can be operated through wide limits of chromic acid and in the range of 80-150° F. The self-regulation feature provides a more foolproof bath, peak throwing power being assured with minimum supervision. The only regular maintenance required is the addition of the catalyst-bearing salts to adjust the solution to the desired Baume reading. Being less sensitive to current interruptions and more activating to nickel, the bath is not as likely to produce "gray" plate and likewise reduces the tendency toward production of undesirable "rainbow" plate at the demarcation of nickel and chromium.

Plating Range Wider—Bright plating range of the SRHS bath is claimed to be considerably wider on the basis of recent tests. Automobile ornaments, plated in a conventional bath, failed to cover below 90 amp current density and burned at more than 150 amp. With the new solution these limits were



Die-cast automotive hardware, in a variety of odd shapes with some deep recesses, is chrome plated with time savings ranging from 20 to 80 per cent. Solution also has a wider bright plate range

from 75 to 190 amp. This means the expense of auxiliary anodes and special preparation of irregularly shaped pieces that formerly were necessary often may be avoided.

Besides these factors contributing to quality of plate, from the practical standpoint the most attractive feature is the important increase possible in plating speed. This means, compared with conventional solutions, that the same thickness can be applied in much less time or that a much greater thickness can be realized in the equivalent time.

Accomplishments Impressive—A few case histories will indicate what some platers have accomplished with the new solutions:

A manufacturer of piston rings cut the plating cycle on applying porous chrome to rings from 5½ hours to 3½ hours resulting in a 36 per cent time saving.

A large plating plant, to meet a schedule of 70,000 die cast pieces per day with full automatic plating equipment, was operating overtime schedules. Change to the new solution reduced each plating cycle by 30 seconds, total savings resulting in elimination of an extra five-hour shift at overtime pay.

A hardware manufacturer reported simplification of work setups for plating, with no special workholders needed to prevent "shading" where contact was made on striker plates. Also eliminated was insertion of stoppers in center-bored knobs to get coverage partially into the hole.

An automotive parts supplier is using the SRHS bath for chroming stainless steel, without any nickel strike, a procedure which normally might have meant hazy deposits and extra buffing of unwieldy work. Lower current consumption also allowed more work to be racked per cycle.

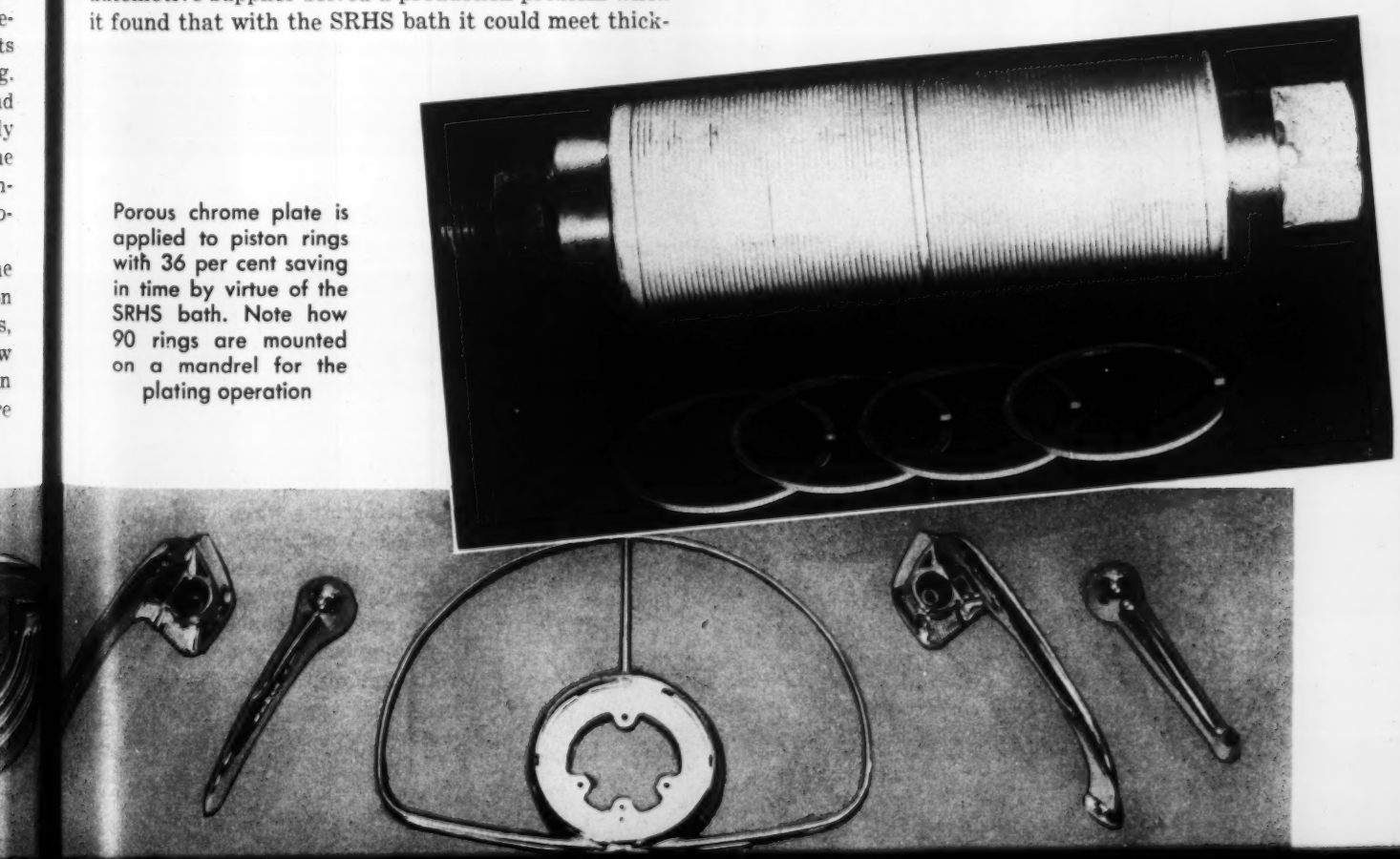
Thickness Specs Met in 100 Seconds—Another automotive supplier solved a production problem when it found that with the SRHS bath it could meet thickness specifications in only 100 seconds, since 40 per cent more chromium was being deposited in this interval. Further, the generator, instead of operating at borderline capacity of 10,000 amp, could be stepped down to 8500 amp for the same work load.

Conventional types of chromium plating equipment and electrical supply are used with the new type bath, with the possible exception of anodes which are more satisfactory in the tin-lead type than antimonial lead. Rather close attention should be paid to anodes because of a tendency toward scaling and coating by salts crystallizing from the bath after idle periods.

Somewhat longer time is needed for the bath to reach equilibrium following makeup, but once it reaches that point, the self-regulating feature minimizes further attention.

24-Inch Barrel Cuts Labor 50%—For the expeditious handling of small parts through chrome plating, United Chromium engineers developed a 24-inch bath-type plating barrel. It is mounted in a 150-gal plastic lined solution tank, with bearings and contacts outside the solution. Anode is stationary inside the barrel.

A typical work load might be 5000 ½-inch wood screws, weighing approximately 10 pounds. Principally because of the high cathode efficiency of the solution, they can be plated in a 10-minute cycle, including loading and unloading time. A sewing machine manufacturer is processing 48 loads of small parts daily, each weighing 10 pounds and totaling in all up to 500,000 pieces daily. A check showed reduction in labor cost over former plating methods of 50 per cent, and a 33 per cent saving in current consumption. An electroplater, processing small screws, reported cutting plating time by a staggering 85 per cent.



Porous chrome plate is applied to piston rings with 36 per cent saving in time by virtue of the SRHS bath. Note how 90 rings are mounted on a mandrel for the plating operation

Different Metal Thicknesses

By C. B. STADUM
Manager, Resistance Welding Control Engineering
Westinghouse Electric Corp.
Buffalo, N. Y.

VARIOUS combinations of material thicknesses on one assembly can now be welded without any adjustment of welding machine controls once the equipment is set up for a given operation. Responsible for this boon to operators, is the newly-developed Timatic resistance welding control system.

The system represents a practical application of some basic information. First the effects of time, pressure and current on the weldability of steel were investigated. It was found possible to set the welding machine pressure at a fixed value, set the current control (or the tap setting of a transformer) at a given value and weld steel thicknesses within a range of 1 to 6 merely by varying the welding time.

The determining factor was found to be the total joint thicknesses and not the number of pieces of steel used in the joint. This means that with a given setting of time two to five thicknesses could be welded so long as the total joint thickness remained constant.

Measures Electrode Motion—The new device, which in its simplest commercial form is limited to welding three ranges of metal thickness, consists of an indicating head mounted on the welding machine. It measures motion of the moving electrode on the welding machine and thus measures the thickness of the material between the electrodes. The indicating head recognizes any three ranges of thickness at a time. It also can be set to measure or to recognize any three different combinations as long as the ratio of minimum to maximum joint thickness is 1 to 6 or less.

The indicating head feeds its intelligence back to a control unit set to adjust the welding time. The control used in this application is a modification of the standard spot welding control such as a NEMA type S-2-H, the N-2 or the N-2-H. These modifications are simply inclusion of a triple weld time which can be set to the three different thicknesses of material.

Where It Can Be Used—Often, on cabinets fabricated by resistance welding, it is common practice to weld brackets, nuts, hinges, etc., onto one assembly. Since each of these items generally have different thicknesses, it was necessary to use multiple machines or special handling to enable them to be welded on one welding machine. Now they can be welded on one machine with no special handling.

What Are the Savings?—Savings can be made in capital equipment by elimination of welders and welder controls. For example, if the system used in welding was to run the assembly through three welder stations, it is possible to eliminate two of the welder stations and effect the saving of a minimum of $1000 per station. The maximum can be as much as $10,000 per station.

If the practice was to weld the assembly at one welder station with one operator by running the work through two or three times or by adjusting the control after each weld was made, it may be possible to save about or almost two-thirds of the time. This means that a given operator may be able to produce from 250 to 300 per cent more work. A savings in operator fatigue also can be realized, since it is no longer necessary for the operator to handle as much weight in the completion of his job.

Savings in floor space to process a given item can also be realized. Storage space for assemblies being welded may be reduced. Fewer welder stations may be possible. Automatic controls of this type may permit the use of different classifications of labor, since the controls are totally automatic and do not rely on the operator for adjustment.

Setup Technique—Set the welding pressure at the highest point consistent with thickness of material; set welding current at the highest value consistent with thickness of the thickest material; vary the welding time in accordance with values necessary to weld the material.

If the thickest combination of material to be welded is known, for example, values of pressure and current will be set that are known to weld this material satisfactorily. After this is determined, the thinnest material is inserted in the throat of the welding machine and the weld time adjusted until satisfactory material is welded at this value.

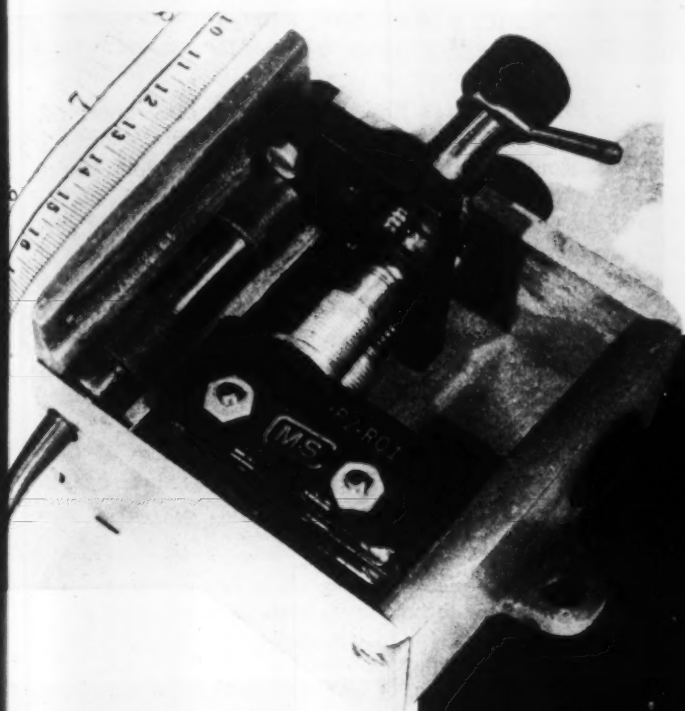
The second thickest material is inserted in the throat, the indicating head adjusted, and the second weld time adjusted to a value which will weld this material. The thickest material is then inserted between the electrodes, the indicating head adjusted and the third weld time selected. Indicating lights on the control indicate what thickness of material is being welded and what time dial is operative.

Use of a large diameter electrode in a given fixed radius is recommended for setup. This radius is 3 inches, the most practical and easily obtainable rating.

Electronic Heat Control Recommended—Although the unit will operate satisfactorily when used without electronic heat control, electronic heat control makes possible the welding of a greater range of thickness of material. By use of a constant pressure system, it is possible to weld a range of thickness of material of one to six if the current control is set accurately. If the current control is far off, as may happen with welding transformers with taps, this total range may not be obtainable.

Welded in One Handling

Time, manpower, floor space, equipment and installation costs saved by a new integrated control system for resistance welding applications involving two to five metal thicknesses



Above—Internal view of indicating head employed in the integrating welding control system. Unit can be mounted either on the stationary machine or moving bracket

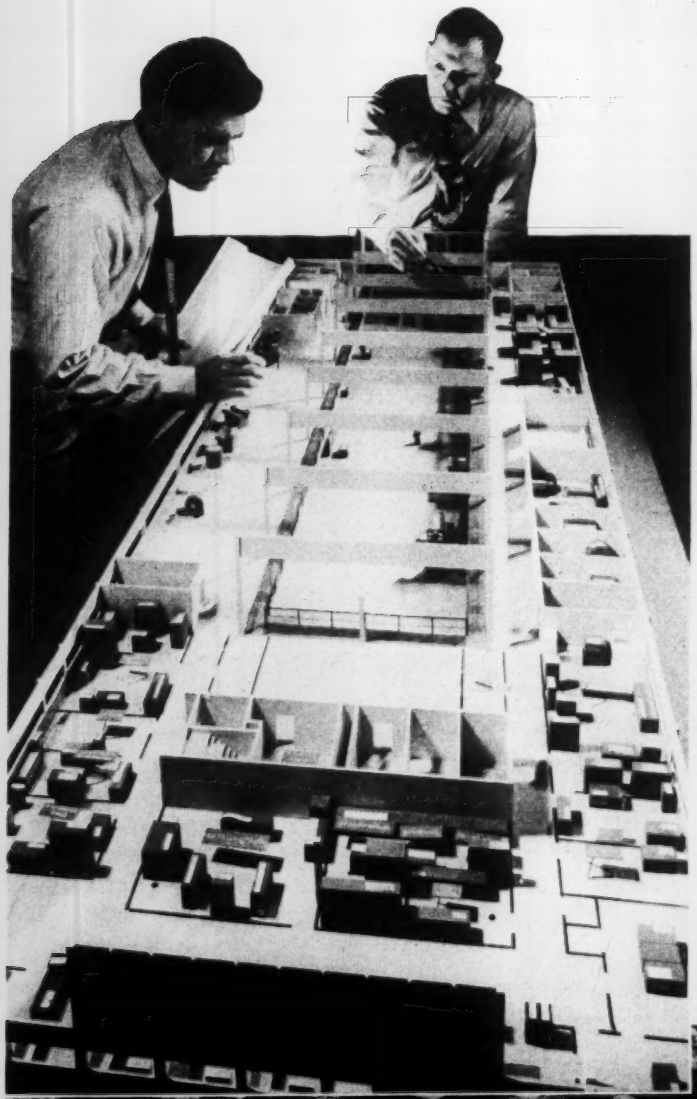
Right—Timatic system developed by Westinghouse is shown here applied to gun welder. Note how indicating head is positioned to clear the work

Research Today for Tomorrow's Profits

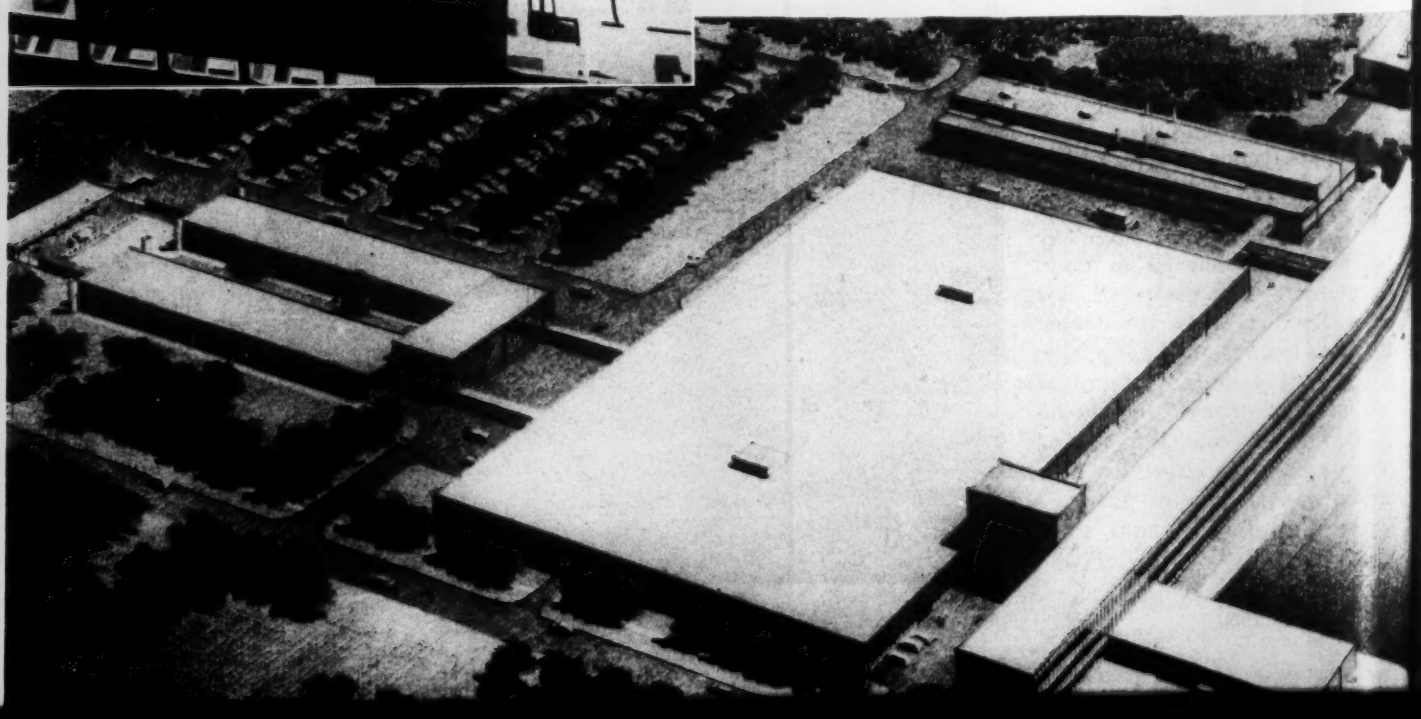
By A. H. ALLEN
Detroit Editor, STEEL

RESEARCH, as "Boss" Kettering once observed, is simply "trying to find out what you are going to do when you can't do what you're doing now any longer."

Few persons are better equipped to know, and perhaps even fewer able to express, the philosophy of research in such apt and homely terms. "Ket" has been researching for over 40 years, starting out in a Dayton, O., barn owned by Col. E. A. Deeds of the National Cash Register Co. with funds partly supplied by his wife's savings from teaching music. This early tinkering with an automobile self-starter gradually evolved into the present expanse of General Motors Research Laboratories Division, operating on a multimillion dollar budget, and even now



Left—Scale-model planning of building layouts, a relatively new technique, extends to research as well as production. This is a model of the experimental foundry plant which will be part of the metallurgy department of GM's technical center



Below—Millions for tomorrow's research speed the drive for newer, better products. This is a section of General Motors' huge new technical center on Detroit's outskirts where the corporation's Research Laboratories Division will be housed. Large building, center, is processing department; upper right, metallurgy department; at left, dynamometer building; lengthy structure, right, is Kettering Laboratories

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Expenditures for development work approach $1 billion annually as industry strives to cut production costs and make better products

American Welding Society, Metals Division, AIME and Society for Non-Destructive Testing meet in Chicago, Oct. 23-27, with over 400 firms at American Society for Metals-sponsored 32nd National Metal Congress & Exposition to exchange ideas on how to achieve higher output in an emergency.

in the early stages of a several-fold expansion as the new General Motors Technical Center takes shape.

National Metal Exposition visitors cannot help being struck with the immensity of research "ideas in action" as they view thousands of materials, processes and equipment set up for their inspection—all of them at one time nothing more than an engineering conception patiently nurtured to reality so that somewhere a job may be done better, at lower cost.

Record Supports Award—It is no mere coincidence that the American Society for Metals medal for the advancement of research will be awarded to C. E. Wilson, General Motors president, on Oct. 26, citing 14 specific developments in the metals field which have emerged from GM research. The automotive industry has been in the vanguard of companies spending large sums for research and in realizing valuable achievement from such expenditures. A recent estimate places these expenditures at a rate of $100 million annually, for research, development and engineering.

Twenty years ago all expenditures for research by U. S. companies amounted to only $166 million. They doubled by 1940, and today are heading for $1 billion annually. This astounding growth is partly explained by inflation and the declining value of the dollar, but more importantly by the recognition of the essentiality of research to industrial progress and even survival. Progress of research in terms of total number of laboratories and their personnel is sized up by Foster D. Snell as follows:

Year	Number of Laboratories	Employees
1920	300	9300
1930	1625	34,200
1940	2350	70,000
1947	2500	135,000
1957 (projected)	5000	250,000

Under the heading of research are included many different types of investigational activity. Basic or fundamental research, often delegated to independent research organizations or to universities; applied or developmental research, frequently the outgrowth of fundamental studies; process development, product study and other analytical techniques at the plant or production level—all may be considered elements of the general research budget.

Research Costs Vary—How much to spend? There is of course no hard and fast rule to determine this. It varies from industry to industry, with management philosophy, funds available, with results which reasonably may be expected. On an average, progressive manufacturers currently are investing about 2 per cent of their gross sales in research. An accompanying tabulation, based on a survey of 983 companies made in 1947 by the National Association of Manufacturers gives a breakdown of gross sales percentage spent on research by a wide range of industries in two prewar years and two postwar years. Unquestionably the percentages for 1950 would be higher in many classifications, not forgetting that gross sales in terms of dollars also will be appreciably higher than was the case three years ago.

Aggregate research expenditures of manufacturers replying in the NAM survey were 270 per cent higher in 1947 than in 1939, and the increase from 1946 to 1947 was 14 per cent. Assuming a proportionate change from 1947 to the present, the 1950 research bill might come to 45 per cent beyond 1947.

"Probing" an Expanding Business—Of the companies replying to the survey questionnaire, 76 per cent stated they were carrying forward a research program, and 74 per cent of these maintained their own research laboratory.

The survey shows that half the companies with gross annual sales of $250,000 or under and running a research program operate their own laboratories, with an average of only three employees; 55 per cent with income from $250,000 to $1,000,000 do likewise and employ an average of five; two-thirds of those with sales between $1 million and $2.5 million average 14 employees in their labs; 70 per cent in the $2.5 million to $5 million category average only four research personnel; 78 per cent in the $5-10 million group average eight; 95 per cent in the $10 million to $25 million class average 32; and above $25 million average 228.

Technical Development Leads—In the three broad categories of research—basic, applied and technical development—over half of 687 companies furnishing data placed their research program in the third type; in other words, development work undertaken to improve present products and processes. About one-quarter of the list indicated efforts are pointed toward both technical development and applied research. The number concentrating solely on basic or applied research was negligible.

What can be expected from a carefully planned and executed research program? Certainly the investment cannot be made blindly, or just because it is the accepted thing to do. First of all, it is probably unwise to consider setting up a research laboratory as such unless the research budget is at least $100,000 a year. It may be the better policy to call on the services of outside laboratories or universities. On the other hand, a research department may be nothing more than a single employee with brains and imagination, working in a corner over some new piece of equipment which he thinks may do the job

better. It is not essential to be too formal over the interpretation of the word research.

Research-Born Items Profitable—As to results, consider, for example, that in 1942 DuPont estimated 46 per cent of its sales were of products which did not exist in 1928. Similarly, Johns-Manville figured recently 56 per cent of its sales were products nonexistent in 1928. And there can be companies named whose sales are 100 per cent of items not known 20 years ago. In the case of one large company, the aforementioned Mr. Snell says a study of research expenditures of ten years showed a return of about 106 per cent annually on them today. In other words, for every dollar spent in research ten years ago, the products developed at that time are returning $1.06 now.

Products of research in the metals field which have grown to commercial stature are endless. For example, the new rare metal elements now being supplied in pure form—titanium, vanadium, zirconium, molybdenum, etc.—are being called "metals of destiny" and in a short time may cut into many applications hitherto held by steel and its alloys, where lighter weight and superior resistance to all forms of corrosion are paramount considerations. Their imminence as practical materials is the direct result of accelerated basic and applied research, much of it sponsored by the Office of Naval Research.

War Spurs Development—War and its accompanying expenditures of billions for military equipment always provide a sharp spur to technical development. In the rush to perfect the best in jet and turbojet types of aircraft, metallurgists have been put to the test to discover new alloys resistant to extremes of gas turbine heat for extended periods of service. To a degree, they have been successful in devising metal combinations of nickel, cobalt, chromium and tungsten and other elements which will stand the 1800-degree blast for reasonable lengths of time. Special ceramic coated metals also show possibilities in this field where much of the work continues of a secret character.

The entire family of stainless and heat-resisting steels is being enlarged steadily as new requirements appear. In television, metal-cone kinescopes have called for something better than 28 per cent chromium stainless which occasionally developed cracks in the metal-to-glass seal. So, metallurgists developed a 17 per cent chromium steel, type 430 modified, stabilized with titanium, columbium, molybdenum, vanadium, tungsten or tantalum in miniscule quantities. The steel is both better in service and lower in cost.

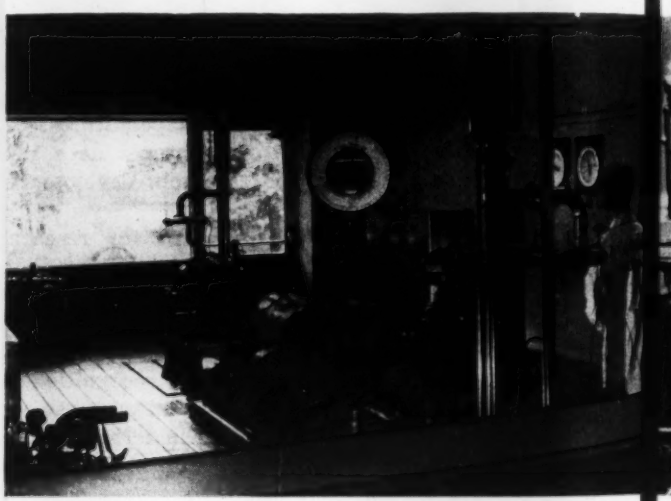
PERCENTAGE OF SALES SPENT ON INDUSTRIAL RESEARCH

Industry	1947	1945	1941	1939
Food and kindred products	1.15	0.49	0.81	1.06
Textile mill products	0.95	0.93	0.32	0.45
Apparel and other finished products	1.65	0.75	0.24	0.32
Lumber and wood products	0.57	0.33	0.38	0.68
Furniture and fixtures	0.50	0.55	0.53	0.54
Paper and allied products	0.72	0.63	0.58	0.71
Printing, publishing and allied industries	2.55	0.74	1.36	1.41
Chemical and allied products	1.83	1.83	1.73	3.17
Products of petroleum and coal	0.74	0.60	0.48	0.41
Rubber products	1.36	0.82	0.68	1.09
Leather and leather products	0.44	0.26	0.26	0.41
Stone, clay and glass products	1.11	1.02	0.97	1.18
Primary metal industries	0.64	0.64	0.78	0.96
Fabricated metal products	1.64	1.19	1.13	1.89
Machinery (except electrical)	1.67	1.31	1.38	2.33
Electrical machinery, equipment and supplies	2.80	3.27	1.99	2.60
Transportation equipment	2.04	1.75	2.89	1.74
Professional, scientific and controlling instruments, photographic and optical goods, watches and clocks	3.34	3.32	2.94	3.65
Miscellaneous manufacturing industries	2.25	1.05	0.91	1.31
General average	1.60	1.36	1.33	1.86

Source: National Association of Manufacturers.

Heating Know-How Aids Production—Heat treating techniques have been making rapid strides as the outgrowth of broad studies of such processes as austempering, martempering and cyclic annealing in salts baths. They offer the choices in selected steels of medium hardness with ductility and toughness; high hardness with little distortion and no residual stresses; and a soft and easily controlled structure ideally suited to subsequent press forging and machining.

Induction heating, hardening and brazing have moved from laboratory to shop in relatively short time. Applications are multiplying rapidly, one of the latest being the installation of an induction heating coil and quenching arrangement on one arbor of a multiple-spindle screw machine, permitting the hardening of a machined small part without removing it from the machine. Companies in the automotive and tractor field now have this system in regular production.



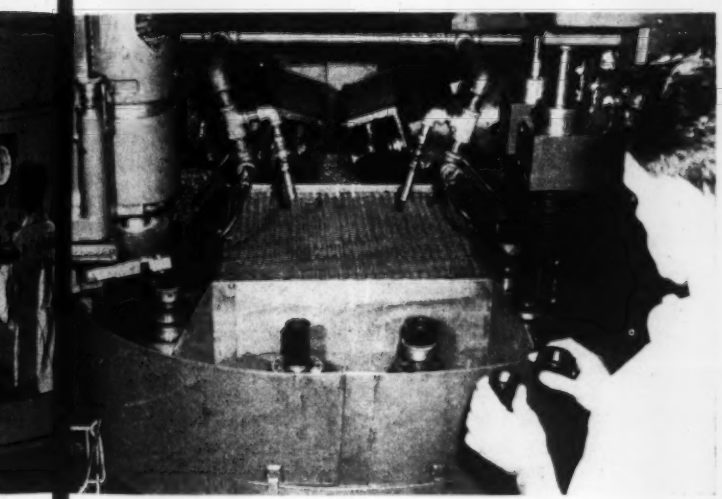
Finding out what you are going to do when you cannot do what you are doing now any longer—is what these research technicians at Ford's new engine development laboratory in Dearborn, Mich., are doing. V-8 engine, foreground, is being tested with a 200-hp direct-current amplidyne dynamometer acting as a brake to determine horsepower. Four universal mounting jacks support engine

Principles "On the Block" — Probably one of the most noteworthy achievements in research which moved from fundamental or theoretical phases into large-scale production in record time is that involved in the isolation of fissionable uranium, and later discoveries in the field of radioactivity. As most people know now, this billion-dollar research has potentialities for untold opportunities of achievement in the fields of medicine and power generation. Research in the latter direction, under way on a broad scale,

may change completely many basic principles now accepted as commonplace.

A stellar research accomplishment in the foundry industry has been nodular or ductile iron. Available commercially for only a couple of years, its proponents now modestly predict it will become the third most important engineering material, tonnage-wise, following steel and gray iron, with annual output holding promise of approaching 5 million tons in the next few years. Paralleling nodular iron and in fact preceding it has been a variety of other inoculants for gray iron which breed improved physical properties through altered microstructure.

Both users and producers of cast metals are studying carefully the outlook for entirely new methods, such as the Croning or "C" process for thin-walled porous sand molds yielding castings of exceptional accuracy and surface finish, or the Mercast method of precision casting by the use of frozen mercury patterns around which mold material is shaped. Beyond these, there has been the broad expansion and commercialization of the lost-wax process of investment casting, not too long ago just a jeweler's trick



Combining operations in one machine to minimize handling brought about this result at Packard's automatic transmission plant in Detroit. Indexing table has four positions—loading, finish grinding, wire brushing and honing. Fixtures carry a long and short pinion gear. After one revolution parts are reversed to finish opposite ends. Production rate is 120 pinions per hour

but redirected by the hands of applied research toward useful industrial applications.

New Evaluating Approach—In the fields of metals testing and stress analysis, some experts feel industry is ready to open a new chapter in metallurgy, which may take 10-15 years to reach fruition. They conclude that the only sound way to evaluate, for example, the relation between hardenability, section size, quenching severity and tempering procedure to the magnitude and direction of residual stresses is by testing actual fabricated component parts and not the conventional test specimens which metallurgists so long have relied upon. The cost will be terrific, they admit, but it appears to open unexplored avenues of analysis which in the long run could throw light on many unexplained phenomena of today.

The foregoing represent only the sketchiest collection of transitions from research to practical usage. The list could be extended for many more pages. To cite briefly a few other significant developments:

Ultrasonic testing for internal defects, beta-ray gages for thickness determination, prepolishing and coating of steel in the flat before forming and plating to avoid tedious buffing operations, ultra-high speed machining installations, self-regulating high-speed chromium plating baths, and so on through every phase of metal fabrication, processing and testing.

Costly—But Worth the Price—Behind them all is research—costly, often discouraging and fruitless, and extremely time-consuming. But at the same time research is essential to keep up with or move ahead of competition, to hold the cost line in face of soaring labor and material, above all to give the ultimate consumer better value or a higher performance price ratio.

What are some specific demands on tomorrow's research? In a recent address before a group of industrial chemists, C. L. McCuen, head of General Motors Research Laboratories, tossed out a few "consummations devoutly to be wished". He spoke as chief of one of the largest research organizations in the world, and at the same time from the viewpoint of an automobile manufacturer. Here are some of his jobs for research:

A low-priced, simple method of preventing the rusting of iron and steel.

A finish in all colors that can be applied in one coat, directly to the body metal, which will give a smooth lustrous appearance without buffing, and which will last for the life of the car.

Electroplating processes which will produce bright plates without buffing. It is estimated the auto industry plates enough metal each year to be equivalent to a 3-foot band 0.001-inch thick extending completely around the world at the equator and requiring the constant use of about 4 million gallons of plating solution.

Better drawing compounds which can be cleaned off stampings more easily particularly where the parts have been standing for a time.

Bearings and lubricants which will carry higher loads.

Large quantities of high-octane fuels at low price for the high-compression engines the industry wants to build.

New and better heat-resisting alloys, with improved wear properties, better machinability, good corrosion resistance, better hardenability and at no increased cost.

What To Look for at the National

Chicago exposition perfectly timed to brief metalworking executives on "how to get more out of less, faster" in face of manpower and materials shortages growing out of America's preparedness drive

By GUY HUBBARD
Machine Tool Editor, Steel

PROBABLY not since the famous Centennial exposition staged in Philadelphia in 1876, has any great American industrial exposition been better timed than the one staged by American Society for Metals at Chicago during the week of October 23, 1950.

The big show in Philadelphia generally is credited by historians with having "broken the back" of a great depression and inspiring the beginning of a long era of technological advancement and industrial expansion.

The big show in Chicago can well go down in history as a powerful factor in the successful launching of a tremendous drive for military preparedness which eventually will insure an era of world peace.

It is certain that the metal show and congress has caught our national production drive at a point early enough to head off a lot of mistakes in use of our limited supply of skilled manpower, our limited supply of new production equipment and our limited supply of strategic metals and other materials.

While the United States by no means has reached the point of being a "have not" nation in any of these respects, we certainly should be conscious by now that in none of these respects are our resources unlimited. It is with that sobering thought in mind that every visitor to Chicago should study the lessons presented by the metal show and congress.

Double-Barreled War—The war which our country now is waging is just as much a war against waste as it is a war against totalitarian ideologies. Waste in industry can be fully as serious a drain upon our national economy in this crucial year of 1950 as is waste and misdirection in governmental activities.

As pointed out in discussions of possibilities of previous shows of this kind, the system under which American production metalworking industries are set up is such that selection of materials, design of parts, cutting, forming and fabricating of these parts; their metallurgical treatment; their inspection, finishing and methods of assembly, all are intimately related. Machining, heat treating, inspection, etc., are being more and more intimately tied together—as is indicated by the accompanying illustrations.

For the reasons just outlined, the so-called metal show actually is a lot broader in scope than that name indicates. As staged within recent years—and particularly as it is staged this year—it is a major industrial exposition built around a "metal core", so to speak. In other words, everyone in industry who is concerned with problems of manpower, materials, methods and machines involved in mass production profitably can spend not one—but several—days at the show.

Manpower—No. 1 Problem—I purposely have listed "manpower" as first among our current problems because recent visits to important machine tool building and machine tool using plants have left no doubt in my mind that it is the No. 1 problem right now—more serious even than material shortages. Experience with previous metal shows—and study of the prospects of the 1950 show—convinces me that you can find the solution to your manpower problems in methods and machines which will be demonstrated.

You yourself will have to do a lot of vigorous "foot work" to track down these things, and you will have to use considerable imagination in some cases to fit them into your own production picture. Furthermore, you must condition yourself to do some ruthless scrapping of outmoded methods and machines when you get back to your home plant. This may demand some lively "scrapping" with your economy-minded associates, so be sure you are "loaded for bear" before you depart from the exposition.

What To Look for—In the realm of materials, primary things to look for will be those which will enable you to get more and more accurate and cheaper and stronger parts out of a given tonnage of metal. Those things may be achieved by new ideas in design which will permit use of sheet and strip material in place of solid blocks; they may be achieved by preforming which eliminates heavy machining; they may be achieved by welding or brazing of simple parts to form more complicated ones; they may be achieved by surface finishing which permits substitution of cheap or plentiful materials for costly or scarce ones.

Keep your eyes constantly on the goal of "less metal in the scrap bin and more in the work." That can mean elimination of spoiled work as well as elimination of too prodigal cutting away of valuable metal in the form of chips. To cut the spoiled work to a minimum, you will need the latest things in testing and gaging equipment. Any apparatus which will catch faulty material before costly work has been done on it, and which will catch dimensional errors before they are repeated, is worth careful study. That includes a wide variety of systems for nondestructive testing and for automatic gaging.

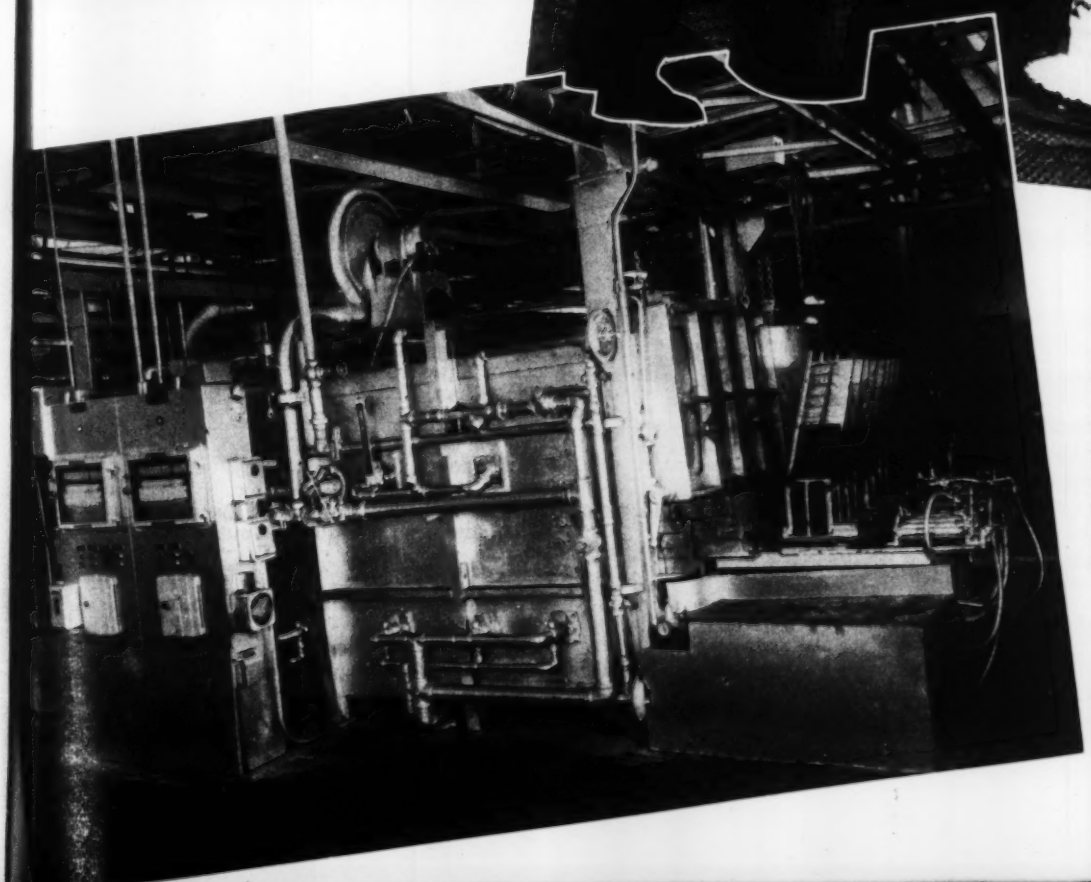
"Doctors of Industry"—The greatest contributions

al Metal Show

which the metallurgists can make in connection with this 32nd Metal Congress and Exposition, will be along lines of protecting industry against infiltration of inferior materials and in suggesting satisfactory substitute materials for those which are growing scarce. In the first case, skill and ingenuity in development and use of chemical and physical laboratory instruments count heavily. In the second case, scientific knowledge of properties of metals and sound common sense in recommending them are outstandingly important.

Cultivate wide acquaintance among the hundreds of metallurgists and experts in related fields at the congress and exposition. They are "doctors of industry" whose specialized training, experience and integrity can be powers for good in your business life, just as those same attributes in your trusted family physician are in your personal life.

Gas carburizing furnaces (right) are in production line with automatic screw machines, heat treating baskets being loaded with tractor track bushings by machine operators—ready for lowering into furnace pits. Modern "clean" methods of steel treating do away with necessity for their segregation from related machining activities



Eight row pusher-type furnace (left) with automatic controls, hardens carburized track bushings to 60-65 Rockwell. Passage from feed magazines to conveyor delivery from quench requires only 45 minutes. Photos courtesy National Acme Co.

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

American Society for Metals

PROGRAM

All Sessions at Palmer House, Oct. 23-27

Monday, Oct. 23—9:30 a.m.

Surface Phenomena Session

Carbonitriding Process of Case Hardening Steel—Part I: Effects of Process Variables, by G. W. P. Rengstorff, M. B. Bever and C. F. Floe, executive officer, Massachusetts Institute of Technology, Cambridge

Carbonitriding Process of Case Hardening Steel—Part II: Constitution of Carbonitrided Cases, by G. W. P. Rengstorff, M. B. Bever and C. F. Floe, executive officer, Massachusetts Institute of Technology, Cambridge.

Effects of Various Alloying Elements in the Coating Bath on the Microstructure and Bend Performance of Hot-Dipped Aluminum Coatings on Steel, by D. O. Gittings, metallurgist, D. H. Rowland, research associate, and J. O. Mack, supervising technologist, Carnegie-Illinois Steel Corp., Pittsburgh.

Formation of Oxides on Some Stainless Steels at High Temperatures, by H. M. McCullough, Sylvania Electric Products Co., Long Island, N. Y., M. G. Fontana, professor and chairman, Department of Metallurgy, Ohio State University, Columbus, and F. H. Beck, assistant research professor, Ohio State University.

Oxidation of Pure Iron, by J. K. Stanley and Miss J. von Hoene, research laboratories, Westinghouse Electric Corp., East Pittsburgh, and R. T. Huntoon, Carnegie Institute of Technology, Pittsburgh.

Monday, Oct. 23—2:00 p.m.

Physical Metallurgy Session

Recovery and Cold Working of 52S Commercial Aluminum Alloy, by Gerard H. Boss, Metallurgy Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.

A Metallurgical Investigation of Silver Chloride, by R. D. Moeller, F. W. Schonfeld, C. R. Tipton Jr., and J. T. Waber, staff members, Los Alamos Scientific Laboratory, Los Alamos, N. M.

Molybdenum Plating by Reduction of Pentachloride Vapor, by W. J. Childs, research metallurgist, J. E. Cline, physical chemist, W. M. Kisner, research assistant, and John Wulff, professor of metallurgy, Massachusetts Institute of Technology, Cambridge.

Structure of Permanent Magnet Alloys, by A. H. Geisler, research associate, General Electric Co., Schenectady, N. Y.

A NEW FEATURE of the National Metal Congress and Exposition will be the ASM Business Forum to be held Thursday morning, October 26, in the grand ballroom of the Palmer House.

Theme will be the outlook for business, with special emphasis upon the resources and ability of American industry to meet the present national emergency. Among those who will participate are Wayne A. Johnston, president of the Illinois Central Railroad Co., representing American railroads; Edward L. Ryerson, chairman of the board of Inland Steel Co., ferrous metal producers; C. Donald Dallas, chairman of the board of Revere Copper & Brass Inc., nonferrous metal producers; William V. O'Brien, commercial vice president, General Electric Co., electrical equipment manufacturers; and Charles E. Wilson, president, General Motors Corp., the automotive industry. E. L. Shaner, editor-in-chief of STEEL, will preside.

The Business Forum will afford officers of metalworking companies an opportunity to hear what leaders of important segments of the metal producing and consuming industries are planning in order to meet the needs of the nation's preparedness program.

Tuesday, Oct. 24—9:30 a.m.

High Temperature Metallurgy Session

Transformations in Ferritic Chromium Steels Between 1100 and 1500° F (595 and 815° C), by F. J. Shortsleeve, research engineer, Materials Division, and M. . Nicholson, assistant section head, Standard Oil Co., Chicago.

Hardening of High-Chromium Steels by Sigma Phase Formation, by John J. Gilman, Research Laboratory, Crucible Steel Co. of America, Harrison, N. J.

Nickel-Aluminum-Molybdenum Alloys for Service at Elevated Temperatures, by H. V. Kinsey, metallurgical engineer and head, High Temperature Metals Section, Department of Mines and Technical Surveys, Ottawa, Canada, and M. T. Stewart, junior research officer, National Research Council of Canada, Ottawa, Canada.

Sigma Phase Formation in a Wrought Heat Resisting Steel, by A. E. Bindari, graduate student, Illinois Institute of Technology, Chicago, P. K. Koh, research engineer, Allegheny Ludlum Steel Corp., Brackenridge, Pa., and Otto Zmeskal, director, Department of Metallurgical Engineering, Illinois Institute of Technology, Chicago.

Tuesday, Oct. 24—2:00 p.m.

High Temperature Metallurgy Session

Formation of Austenite in High Chromium Stainless Steels, by C. B. Post, metallurgist, and W. S. Eberly, Carpenter Steel Co., Reading, Pa.

Influence of Austenitizing Time and Temperature on Austenite Grain Size of Steel, by O. O. Miller, U. S. Steel Corp., Research Laboratory, Kearney, N. J.

Carbide Precipitation in AISI Type 304 Stainless Steel—An Electron Microscope Study, by E. M. Mahla and N. A. Nielsen, Engineering Research Laboratory, E. I. du Pont de Nemours & Co., Wilmington, Del.

Some Aspects of Graphitization in Steel, by G. V. Smith, J. A. MacMillian, and E. J. Dulis, U. S. Steel Corp., Research Laboratory, Kearny, N. J.

Wednesday, Oct. 25—9:30 a.m.

ASM Annual Meeting

Edward De Mille Campbell Memorial Lecture, by Earle C. Smith, chief metallurgist, Republic Steel Corp., Cleveland.

Wednesday, Oct. 25—2:00 p.m.

Heat Treatment Session

A Hardenability Test for Deep Hardening Steels, by William Wilson Jr., research metallurgist, Armour Research Foundation, Chicago.

An Examination of the Quenching Constant H, by D. J. Carney and A. J. Janulionis, Carnegie-Illinois Steel Corp., Chicago.

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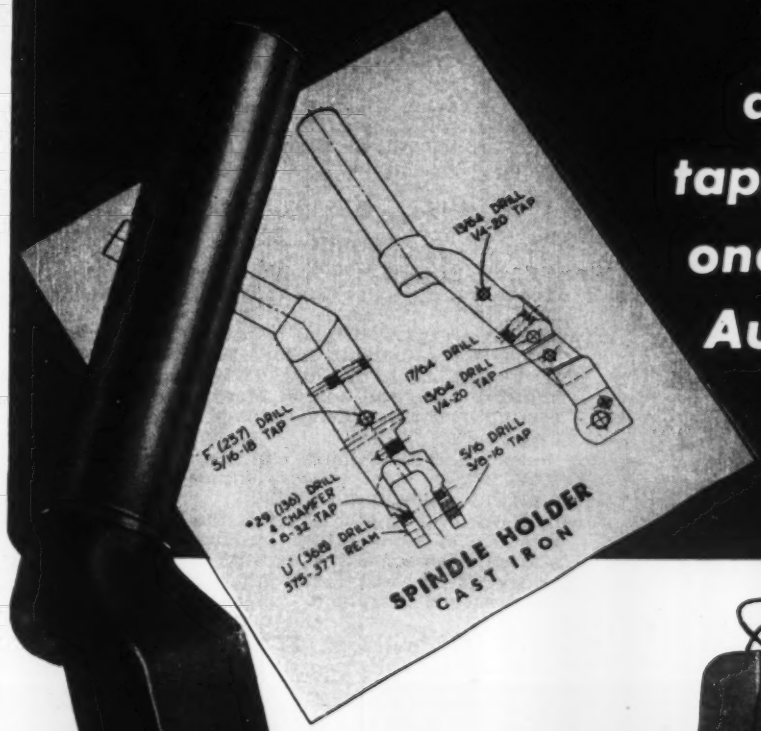

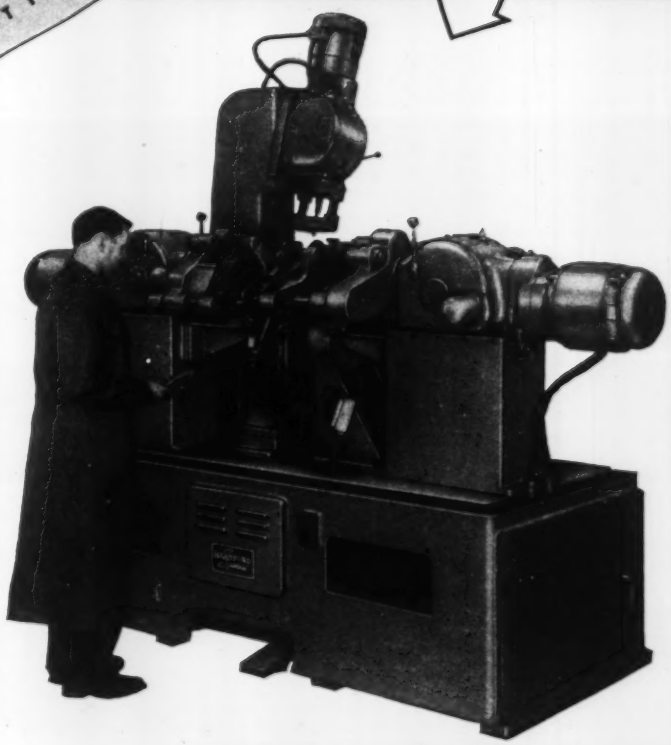

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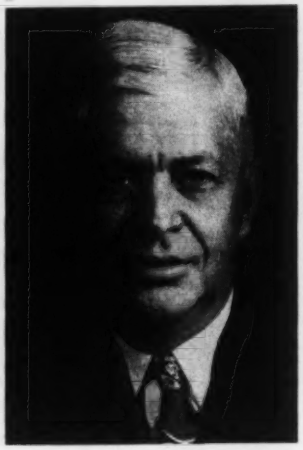
1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

WALTER E. JOMINY
President, American Society for Metals 1950-51



CHARLES E. WILSON
Recipient, ASM Medal for Advancement of Research

Tempering of Chromium Steel, by R. W. Balluffi, Research Laboratory, Sylvania Electric Products Inc., Bayside, N. Y., Morris Cohen, professor of metallurgy, and B. L. Averbach, assistant professor of metallurgy, Massachusetts Institute of Technology, Cambridge.

Austenite Transformation, by Axel Hultgren, professor of metallography, K. Tekniska Hogskolan, Stockholm, Sweden.

Thursday, Oct. 26—9:30 a.m.

Fracture Session

Distribution of the Solute Element Between the Grain and Grain Boundary in Solid Solutions: The Mechanism of Temper Brittleness in Steel, by J. W. Spretnak, associate professor of metallurgy, and Rudolph Speiser, member of staff, Ohio State University, Columbus.

Effect of Strain Rate on Toughness of Temper Brittle Steel, by D. C. Buffum and L. D. Jaffe, Watertown Arsenal, Watertown, Mass.

Influence of Chromium on Mechanical Properties of Plain Chromium Steels, by W. O. Binder, research metallurgist, and Howard R. Spendelow Jr., research metallurgist, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y.

Rheotropic Embrittlement of Steel, by E. J. Ripling, research asssociate, and W. M. Baldwin Jr., research professor, Case Institute of Technology, Cleveland.

Embrittlement of Stainless Steels by Steam in Heat Treating Atmospheres, by C. A. Zapffe and R. L. Phebus, research metallurgists, Baltimore, Md.

Thursday, Oct. 26—9:30 a.m.

Constitution of Alloys Session

Ternary System Chromium-Molybdenum-Iron, by J. W. Putman, research assistant, Massachusetts Institute of Technology, Cambridge, R. D. Potter, assistant professor of metallurgy, University of California, Berkeley, Calif., and N. J. Grant, associate professor, Massachusetts Institute of Technology, Cambridge.

Ternary System Indium-Cadmium-Zinc, by S. C. Carapella Jr., O'Brien fellow, E. A. Peretti, professor of metallurgy, University of Notre Dame, South Bend, Ind.

Determination of Solidus Temperatures in Magnesium Alloys by Dilatometric Measurements, by Heinrich Adenstedt, Wright-Patterson Air Force Base, Dayton, O., and Jay R. Burns, Dow Chemical Co., Midland, Mich.

Constitution and Mechanical Properties of Zirconium-Iron Alloys, by E. T. Hayes, A. H. Roberson, and W. L. O'Brien, Metallurgists, Bureau of Mines, Albany, Ore.

Thursday, Oct. 26—2:00 p.m.

Fracture Session

Fracturing of Silicon-Ferrite Crystals, by C. F. Tipper, Cambridge University, England, and M. Sullivan, metallurgist, Naval Research Laboratory, Washington, D. C.

A Study of Cleavage Surfaces in Ferrite, by E. P. Klier, associate professor, University of Maryland, College Park, Md.

Fractographic Registrations of Fatigue, by C. A. Zapffe and C. O. Worden, research metallurgists, Baltimore, Md.

Effect of Alloying Elements on Notch Toughness of Pearlitic Steels, by J. A. Rinebolt and W. J. Harris Jr., Ferrous Alloys Branch, Naval Research Laboratory, Washington, D. C.

Friday, Oct. 27—9:30 a.m.

Plasticity Session

Stress-Strain-Energy Relationship for Metals, by D. J. McAdam Jr., consulting metallurgist, Washington, D. C.

Tension-Compression Biaxial Plastic Stress-Strain Relations for Aluminum Alloys 24S-T and 2S-O, by J. H. Faupel, E. I. du Pont de Nemours & Co., Wilmington, Del., and Joseph Marin, professor of engineering mechanics, Pennsylvania State College, State College, Pa.

Hot Forming of Aluminum and Magnesium Alloys, by T. E. Piper, chief process engineer, Northrop Aircraft Inc., Hawthorne, Calif.

Strain Hardening of Mild Steel in the Torsion Test as a Function of Temperature, by Hugh Larson, graduate student, Massachusetts Institute of Technology, Cambridge, Mass., and E. P. Klier, associate professor, University of Maryland, College Park, Md.

Friday, Oct. 27—9:30 a.m.

Physical Metallurgy Session

Powder Metallurgy of Beryllium, by H. H. Hausner, section head, and Norman P. Pinto, senior engineer, Sylvania Electric Products Inc., Bayside, N. Y.

Dimensional Behavior of Invar, by B. S. Lement, assistant professor of metallurgy, University of Notre Dame, South Bend, Ind., B. L. Averbach, assistant professor of physical metallurgy, and Morris Cohen, professor of physical metallurgy, Massachusetts Institute of Technology, Cambridge.

Preparation and Properties of Titanium-Chromium Binary Alloys, by D. J. McPherson, Armour Research Foundation, Chicago, and M. G. Fontana, professor and chairman, Dept. of Metallurgy, Ohio State University, Columbus.

Relation of Carbon, Manganese, Phosphorous, Silicon, Titanium and Molybdeum to Yield Strength, Tensile Strength and Elongation of Seamless Steel Tubes, by W. T. Rogers, metallurgical statistician, National Tube Co., Lorain, O.

Grindability of Tool Steels, by L. P. Tarasov, Research Laboratories, Norton Co., Worcester, Mass.

American Society for Metals

Seminar on Atom Movements

Sessions at Stevens Hotel & Palmer House, Oct. 21-22

Saturday, Oct. 21, 9:30 a.m., Stevens Hotel

Formal Basis of Diffusion Theory, by L. Darken, U. S. Steel Corp., Research Laboratories, Kearny, N. J.

Chemical Techniques and Analysis of Diffusion Data, by Cyril Wells, Carnegie Institute of Technology, Pittsburgh.

Tracer and Other Techniques, by R. Hoffman, General Electric Co., Research Laboratory, Schenectady, N. Y.

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extra light gauge stainless steel

During the current critical nickel shortage MicroRold's close tolerance light gauge sheets offer an excellent opportunity to secure more square feet of stainless steel per ton.

The outstanding uniformity of gauge, found in MicroRold is producing greater area per ton, longer die life and less rejects. Reduced finishing costs are permitted through its excellent surface qualities. Savings in purchase weight are made possible by ordering MicroRold to a decimal thickness with usual MicroRold tolerance of plus or minus 3%. Extra-light gauges are no longer limited to narrow widths—we are supplying sheets up to 36″ wide as light as .010 in thickness and sheets 30″ wide as light as .005.

Why not make use of the exclusive advantages offered by MicroRold extra-light gauges?

WASHINGTON STEEL CORPORATION

Washington, Pennsylvania

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Saturday, Oct. 21, 2:00 p.m., Stevens Hotel

Mechanisms of Diffusion, by H. Huntington, Rensselaer Polytechnic Institute, Troy, N. Y.

Diffusion in Two Component System, by J. Bardeen, Bell Telephone Laboratories, New York.

Analysis of Bulk Diffusion Data, by C. E. Birchenall, Carnegie Institute of Technology, Pittsburgh.

Sunday, Oct. 22, 9:30 a.m., Palmer House

Surface and Boundary Diffusion, by D. Turnbull, General Electric Co., Research Laboratories, Schenectady, N. Y.

Diffusion and High Temperature Oxidation, by C. Wagner, Massachusetts Institute of Technology, Cambridge.

Gas Metal Diffusion and Internal Oxidation, by F. N. Rhines, Carnegie Institute of Technology, Pittsburgh.

Sunday, Oct. 22, 2:00 p.m., Palmer House

Diffusion in Sintering, by P. Duwez, California Institute of Technology, Pasadena, Calif.

Boundary Movements, by J. Burke, General Electric Co., Knolls Atomic Power Laboratory, Schenectady, N. Y.

Summary, by R. F. Mehl, Carnegie Institute of Technology, Pittsburgh.

General Discussion

American Society for Metals

Educational Lectures

All Sessions at Palmer House, Oct. 23-25

Monday, Oct. 23

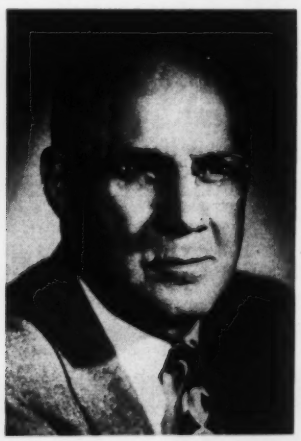
High Temperature Properties of Metals

4:15 p. m.—Stress Rupture Testing, by N. J. Grant, Massachusetts Institute of Technology, Cambridge.

5:15 p. m.—Fatigue, by Howard C. Cross, Battelle Memorial Institute, Columbus, O.

8:00 p. m.—Creep, by Earl R. Parker, University of California, Berkeley, Calif. Service Experience, by John J. B. Rutherford, Babcock & Wilcox Tube Co., Beaver Falls, Pa.

EARLE C. SMITH
ASM Campbell Memorial Lecturer



CLARENCE E. SIMS
Recipient, ASM Albert Sauveur Achievement Award

9:00 p. m.—Oxidation, by Carl Wagner, Massachusetts Institute of Technology, Cambridge.

Tuesday, Oct. 24

Interpretation of Tests and Correlation with Service

4:15 p. m.—Correlation of Laboratory Tests and Service Performance, by M. F. Garwood, H. H. Zurburg and M. A. Erickson, Chrysler Corp., Detroit.

5:15 p. m.—Wear Tests and Service Performance, by J. T. Burwell, Massachusetts Institute of Technology, Cambridge.

8:00 p. m.—Corrosion Tests vs. Service Performance, by Frank LaQue, International Nickel Co., New York.

9:00 p. m.—Limitations of Mechanical Testing, by M. Gensamer, Carnegie-Illinois Steel Co., Pittsburgh.

Wednesday, Oct. 25

Metallurgy of Titanium

4:15 p. m.—Historical Development, Extractive Metallurgy, General Properties,
1, Development of Ductile Titanium, by W. J. Kroll, Bureau of Mines;
2, The Iodide Dissociation Process, by W. J. Kroll, Bureau of Mines;
3, Magnesium Reduction Process, by F. S. Wartman, Bureau of Mines.

5:15 p. m.—Melting, Casting, Working, Fabrication, and Testing, by W. L. Finlay, Remington Arms Co., Bridgeport, Conn.

8:00 p. m.—Alloys of Titanium, by Robert Jaffee, Battelle Memorial Institute, Columbus.

American Welding Society

PROGRAM

All Sessions at Hotel Sherman, Oct. 23-27

Sunday, Oct. 22, 5:00 p.m.

President's Reception

Monday, Oct. 23, 9:30 a.m.

Weldability

Chairman—R. E. SOMERS, Bethlehem Steel Co., Bethlehem, Pa.
Co-Chairman—L. C. BIBBER, Carnegie-Illinois Steel Co., Pittsburgh

Influence of Cooling Rates on Arc Weld Ductility, by A. E. Flanigan, S. I. Bocarsky and G. B. McGuire, University of California, Berkeley.

Effect of Nitrogen on Brittle Behavior of Steel, by G. H. Enzian and G. J. Salvaggio, Jones & Laughlin Steel Corp., Pittsburgh.

Micro-Mechanism of Fracture of Structural Steels, by W. H. Bruckner, University of Illinois, Urbana.

Influence of Biaxiality on Notch Brittleness, by D. Rosenthal, University of California, Berkeley, and W. D. Mitchell, Douglas Aircraft Co., Santa Monica, Calif.

Resistance Welding

Chairman—JACK OGDEN, Fisher Body Div., General Motors Corp., Detroit
Co-Chairman—R. E. POWELL, Western Electric Co., New York

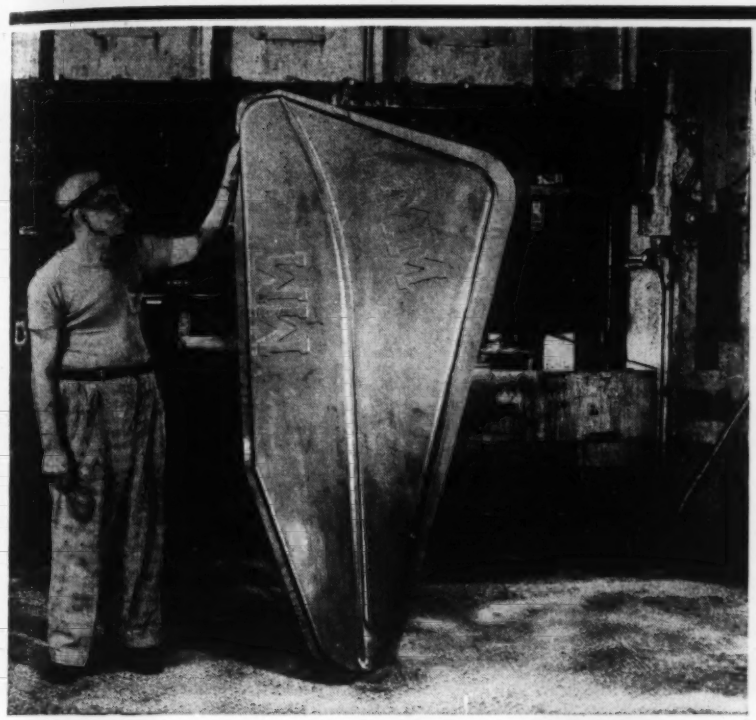
Development of Production Welding Techniques, by J. Raymond Wirt, Delco-Remy Division, General Motors Corp., Dayton, O.

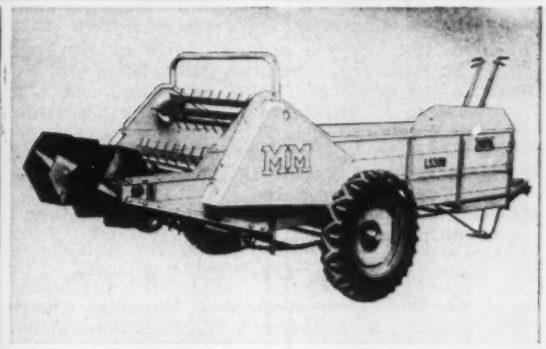
Spot Welding of Thin Materials, by Franklin Page Jr., Du Fresne & Page Engineering Co., and Frank Johnson, Unitek Corp.

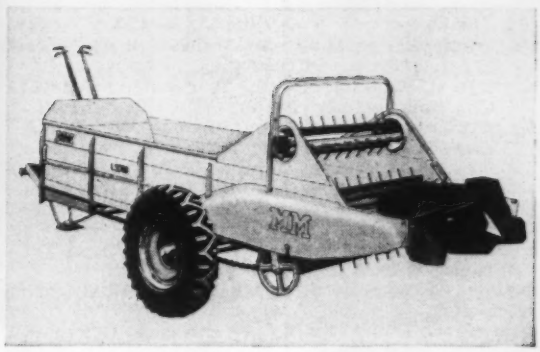
Tube Mills for High-Speed Production, by Donald H. Fleig, American Electric Fusion Corp., Chicago.

Spreading Resistance of Contacts, by Dr. W. B. Kouwenhoven, John Hopkins University, Baltimore and W. T. Sackett Jr., Battelle Memorial Institute, Columbus, O.

METAL STAMPINGS







...give a streamlined appearance...save time and cost of hand fabrication of these large, heavy-gauge shields for MINNEAPOLIS-MOLINE

USS STEEL

USED IN STAMPING THIS PART

The LEAKE organization appreciates the close cooperation of steel men in making available sheets with metallurgical properties that enable us to accomplish *the unusual in metal stampings.*

Formerly, both of the shields for this spreader were hand fabricated and the sharp, square corners of the parts resulted in a bulky, out-dated appearance.

Customer engineers, with the cooperation of the LEAKE organization, planned production of these shields to combine drawing and embossing from one large draw die. Two heavy-gauge parts were deep drawn in a single sheet with one initial press operation. Then they were cut apart, trimmed and hole-cut.

The smooth, round edges of these shields add to the appearance of the machine, and the embossed trade marks are made permanent with no added cost.

This is a typical example of design improvement, and a reduction in product cost so often made possible by using metal stampings produced by the LEAKE organization.

If you have a similar problem send us a blue print or drawing of your part. We'll be frank in telling you if metal stampings offer no advantage over your present method of production...but if they do, we would like to show you how we can help you.

THE LEAKE ORGANIZATION *can furnish metal stampings in* ANY SIZE · ANY THICKNESS · ANY SHAPE · ANY ANALYSIS

THE LEAKE STAMPING COMPANY · MONROE, MICHIGAN

LEAKE

EXPERTS IN PRESSED METAL

COMPLETE PRESSROOM—MACHINE SHOP
HEAT TREAT—BRAZING—WELDING
TESTING AND INSPECTION

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Surfacing

Chairman—T. B. JEFFERSON, *The Welding Engineer*
Co-Chairman—R. L. TOWNSEND, Tweco Products Co., Wichita, Kan.

Characteristics of Composite Tungsten Carbide Welds, by H. S. Avery, American Brake Shoe Co., New York.
Hard Facing of Steam Valve Seats and Disks, by O. E. Swenson, U. S. Naval Engineering Experiment Station, Washington, D. C.
New Production Applications of Hard Facing, by Eldon C. Hurt, Haynes Stellite Division, Union Carbide & Carbon Corp., Kokomo, Ind.
Status of Composite Fabrication by Arc Welding, by H. E. Cable, Lincoln Electric Co., Cleveland.

Monday, Oct. 23, 2:00 p.m.

Panel Discussion on Resistance Welding, Sponsored by A. W. S. Resistance Welding Committee

Chairman—J. HEUSCHKEL, Western Electric Corp., Pittsburgh
Co-Chairman—J. J. MacKINNEY, Budd Co., Philadelphia

Historical Background, by Wilson Scott, Westinghouse Electric Corp., Pittsburgh.
Keynote of Quality, by R. T. Gillette, General Electric Co., Schenectady, N. Y.
Aluminum and Magnesium Alloys, by W. J. Wilson, Lavelle Aircraft Corp., Newtown, Pa.
Copper Alloys and Dissimilar Nonferrous Metals, by J. B. Welch, Cutler-Hammer Inc., Milwaukee.
Carbon and Low-Alloy Steels, by J. Heuschkel, Westinghouse Electric Corp., Pittsburgh.
Nickel and Nickel Alloys, by R. M. Wilson Jr., International Nickel Co., New York.
Stainless Steels, by J. J. MacKinney, Budd Co., Philadelphia.
Coated Materials, by E. A. Bussard, Coleman Co. Inc., Wichita, Kan.
High Speed Motion Pictures
Summary and Adjournment

Research

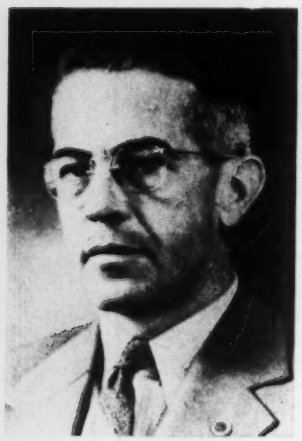
Chairman—PERRY R. CASSIDY, Babcock & Wilcox Co., New York
Co-Chairman—F. L. PLUMMER, Hammond Iron Works, Warren, Pa.

Tensile Tests as an Index of Transition Temperature, by S. S. Tor, R. D. Stout and Bruce G. Johnston, Lehigh University, Bethlehem, Pa.
Interpretive Report, Fabrication Division, PVRC, by H. C. Boardman, Chicago Bridge & Iron Co., Chicago.
Plastic Deformation of Weldments, by William S. Pellini and C. E. Hartbower, Naval Research Laboratory, Washington, D. C.

Flame Hardening

Chairman—A. F. CHOUINARD, National Cylinder Gas Co., Chicago
Co-Chairman—E. C. BREKELBAUM, Harnischfeger Corp., Milwaukee

Commercial Flame Hardening, by E. J. Cox, Pittsburgh Commercial Heat Treating Co., Pittsburgh.
Flame Hardening of Large Surfaces, by J. J. Barry, Air Reduction Sales Co., New York.
Production Flame Hardening, by Milton Garvin, Cincinnati Milling Machine Co., Cincinnati, O.



H. W. PIERCE
President, AWS, 1950-51

C. H. JENNINGS
1950 Adams Lecturer, AWS

Arcs, Electrodes & Fluxes

Chairman—C. I. MacGUFFIE, General Electric Co., Schenectady, N. Y.
Co-Chairman—H. E. ROCKEFELLER, Linde Air Products Co., New York

Techniques for Study of Arcs in Inert Atmospheres, by Roger H. Gillette, Linde Air Products Co., New York, and R. T. Breymeier, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y.
Aluminum-Magnesium Filler for Aluminum Alloys, by R. D. Williams and D. C. Martin, Battelle Memorial Institute, Columbus, O.
Characteristics of Inert-Gas-Shielded Metal Arcs, by Albert Muller, G. R. Rothschild and W. J. Greene, Air Reduction Co. Inc., New York.

Monday, Oct. 23, 8:00 p.m.

Award of Medals and Prizes

1950 Adams Lecture: Dynamic Characteristics of DC Welding Machines, by C. H. Jennings, Westinghouse Electric Corp., Buffalo, N. Y.

Tuesday, Oct. 24, 9:30 a.m.

Pipe Fabrication

Chairman—D. H. COREY, Detroit Edison Co., Detroit
Co-Chairman—E. R. SEABLOOM, Crane Co., Chicago

Welding Procedure for High Pressure Steam Piping, by N. L. Navarre, U. S. Naval Engineering Experiment Station, Washington, D. C.
Fabrication and Welding of Alloy Piping, by H. J. Irrgang Jr., W. K. Mitchell & Co., Philadelphia.
Design and Installation of Large, Long Welded Pipe, by Horace Jackson, Thompson Pipe & Steel Co., Denver.
Welding of 347 Stainless Steel, by R. W. Emerson, Pittsburgh Piping & Equipment Co., Pittsburgh.

Resistance Welding

Chairman—T. EMBURY JONES, Precision Welder & Machine Co., Cincinnati, O.
Co-Chairman—R. C. McMASTER, Battelle Memorial Institute, Columbus, O.

Method for Obtaining Consistent Resistance Welds, by J. W. Kehoe, Westinghouse Electric Corp., Pittsburgh.
Variables in Cross-Wire Welding Dissimilar Metals, by I. S. Goodman, Westinghouse Electric Corp., Pittsburgh.
DC Spot and Seam Welding of Aircraft Materials, by J. H. Cooper, Taylor-Winfield Corp., Warren, O.
Projection Welding of 0.010 and 0.020-Inch Steel, by E. F. Nippes, J. M. Gerken and J. G. Maciora, Rensselaer Polytechnic Institute, Troy, N. Y.

Ship Structure

Chairman—CAPT. C. M. TOOKE, Bureau of Ships, Washington, D. C.
Co-Chairman—COMDR. R. D. SCHMIDTMAN, U. S. Coast Guard.

Work of the Ship Structure Committee, by Rear Admiral K. K. Cowart, U. S. Coast Guard, Washington, D. C.
Welded Reinforcement of Openings in Steel Members, by D. Vasarhelyi and R. A. Hechtman, University of Washington, Seattle.
Initial Stresses and Tests on Steel Plates, by Prof. E. W. Suppiger, Dr. Carlo Riparbelli and E. R. Ward, Princeton University, Princeton, N. J.
Some Metallurgical Aspects of Ship Steel Quality, by H. M. Banta, R. H. Frazier and Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, O.

Tuesday, Oct. 24, 2:00 p.m.

Resistance Welding

Chairman—B. L. WISE, National Electric Welding Machine Co., Bay City, Mich.
Co-Chairman—J. F. RANDALL, Ford Motor Co., Detroit

Optimum Flash Welding Conditions—Upset Variables, by Nippes, Savage, Patriarca and McCarthy, Rensselaer Polytechnic Institute, Troy, N. Y.
Flash Welding Nonferrous Materials, by F. L. Brandt Jr., Thomson Electric Welder Co., Lynn, Mass.
Spot Welding of Scaly Heavy-Gage Structural Steel, by Nippes, Ramsey and Maciora, Rensselaer Polytechnic Institute, Troy, N. Y.

Design

SPECIAL LUNCHEON—12:30

Design for Production Economies, by G. F. Nordenholt, editor, *Product Engineering*
Chairman—G. F. NORDENHOLT, *Product Engineering*
Co-Chairman—H. W. PIERCE, New York Shipbuilding Corp., New York
Organization for Design for Production Economy, by T. J. Crawford, consulting engineer
Economies Accomplished by Redesign for Welding, by Kenneth Jackson, Caterpillar Tractor Co., Peoria, Ill.
Applications of Welded Design for Cost Reduction, by R. H. Bennewitz, Linde Air Products Co., New York.

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

HOWARD S. AVERY
Recipient, 1950 Lincoln Gold Medal, AWS

DR. WENDELL F. HESS
Recipient, Samuel Wylie Miller Memorial Medal, AWS

Ship Structure

Chairman—D. P. BROWN, American Bureau of Shipping, New York
Co-Chairman—FINN JONASSEN, National Research Council, Washington, D. C.

Notch Sensitivity of Welded Plate by Explosion Test, by G. S. Mikhalapov, Metallurgical Research Development Co. Inc.

Stress Studies of Welded Ship Structure Specimens, by Wm. R. Campbell, Engineering Mechanics Section, National Bureau of Standards, Washington, D. C.

Locked-In Stressed in a Larger Welded Box Girder, by John Vasta, Bureau of Ships, Navy Department, Washington, D. C.

Tuesday, Oct. 24, 8:00 p.m.

Applied Welding Engineering

A Symposium on Proper Application of Welding Processes sponsored by A. W. S. Technical Activities Committee.

Chairman—C. D. EVANS, chairman, Technical Activities Committee
Co-Chairman—S. A. GREENBERG, technical secretary, A.W.S.

Introduction, by C. D. Evans, International Harvester Co., Chicago.

Design, by J. J. Chyle, A. O. Smith Corp., Milwaukee (chairman, Automotive Welding Committee).

Materials, by A. N. Kugler, Air Reduction Sales Co., New York (chairman, Committee on Brazing and Soldering).

Workmanship, by R. W. Clark, General Electric Co., Schenectady, N. Y. (chairman, Committee on Standard Qualification Procedures and Army Ordnance Advisory Committee).

Inspection, by J. Lyell Wilson, consulting engineer, (vice-chairman, Technical Activities Committee and chairman, Committee on Welding in Marine Construction).

Applications, by S. A. Greenberg, technical secretary, American Welding Society.

Discussion

Wednesday, Oct. 25, 9:30 a.m.

Research

Chairman—G. E. CLAUSSEN, Reid-Avery Co., Baltimore
Co-Chairman—O. T. BARNETT, Metal & Thermit Corp., New York

Rotary Electrode for Manual Metallic Arc Welding, by Gilbert S. Schaller, University of Washington, Seattle.

Effects of Reduced Atmosphere Pressures on Arc Welding, by M. L. Begeman, B. H. Amstead and U. I. Mashruwala, Dept. of Mechanical Engineering, University of Texas, Austin.

Transformation of Austenite in Mang. Moly. Weld Metal, by O. O. Miller, F. C. Kristufek and R. H. Aborn, United States Steel Corp., Pittsburgh.

Stress Relieving and Fracture Strength, by D. Swan, A. R. Lytye and C. McKinsey, Union Carbide & Carbon Research Laboratories, Inc., Niagara Falls, N. Y.

Education

Chairman—R. S. GREEN, Ohio State University, Columbus
Co-Chairman—M. L. BEGEMAN, University of Texas, Austin

Symposium on the Need of Professional Training for the Welding Engineer

Employer Point of View:

Representative of Bureau of Ships, Navy Dept., by A. G. Bissell, Washington, D. C.

Representative of Industrial Research, by J. Heuschkel, Westinghouse Electric Corp., Pittsburgh

Representative of Fabrication Industry, by J. J. Chyle, A. O. Smith Corp., Milwaukee.

Professional Training of a Welding Engineer, by Dr. J. M. Parks, Armour Research Foundation, Chicago.

College Point of View:

Representative of an Eastern Private University, by Dr. G. E. Doan, professor of metallurgy, Lehigh University, Bethlehem, Pa.

Representative of a Private Engineering School, by Professor R. A. Wyant, assistant professor, Department of Metallurgy, Rensselaer Polytechnic Institute, Troy, N. Y.

Representative of a Western State University, by Prof. G. S. Schaller, professor mechanical engineering, University of Washington, Seattle.

Papers to be followed by an author's round table and general discussion.

Structural

Chairman—L. S. McPHEE, Whiting Corp., Harvey, Ill.
Co-Chairman—I. E. BOBERG, Chicago Bridge & Iron Co., Chicago

Connections for Welded Rigid Portal Frames, by A. Anthony Topractsoglou, Lynn S. Beedle and Bruce G. Johnston, Lehigh University, Bethlehem, Pa.

Stress Redistribution for a Welded Frame, by L. E. Grinter and John Butkus, Illinois Institute of Technology, and Charles G. Peller, Valparaiso University, Valparaiso, Ind.

Buckling of Rectangular Plates, by C. H. Norris, D. A. Polychrone and L. J. Capozzoli, Massachusetts Institute of Technology, Cambridge.

Welded Eccentric Girders for Composite Bridges, by R. E. Robertson, consulting engineer, Saxe, Williar and Robertson.

Wednesday, Oct. 25, 2:00 p.m.

Machinery and Maintenance

Chairman—R. C. McFARLAND, Western Electric Co., New York
Co-Chairman—J. C. MENZIES, J. C. Menzies & Co.

Welding Used in Manufacture of Farm Tractors, by J. L. Buchholz, International Harvester Co., Farmall Works, Rock Island, Ill.

Tubular Sections in Frames of Hydraulic Benders, by E. J. DeWitt, Wallace Supplies Mfg. Co., Chicago.

Electric Utility Welding in the Shop and Field, by David P. O'Connor, Department of Water and Power, City of Los Angeles, Calif.

Controls, Standards

Chairman—J. LYELL WILSON, consulting naval architect
Co-Chairman—ROGER CLARK, General Electric Co., Schenectady, N. Y.

Procedure Approval Tests, by S. S. Katsef, U. S. Naval Engineering Experiment Station, Washington, D. C.

Better Welding at Lower Costs, by Lew Gilbert, editor, *Industry and Welding.*

Suggested New Welding Standards, by J. F. Lincoln, Lincoln Electric Co., Cleveland.

Machine Welding

Chairman—F. E. McATEE, Chicago Bridge & Iron Co., Chicago
Co-Chairman—AMEL R. MEYER, Graver Tank & Mfg. Co., East Chicago, Ind.

Multiple Electrodes in Submerged Melt Welding, by E. L. Frost and A. R. Lytle, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y.

Automatic Welding in Steel Mill Maintenance, by W. P. Hoffman, International Harvester Co., Wisconsin Steel Works, South Chicago, Ill.

Wednesday, Oct. 25, 6:30 p.m.

National and Section Officers' Dinner
University Research Dinner

Wednesday, Oct. 25, 7:30 p.m.

Business Meeting and Section Officers' Conference
University Research Conference

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Thursday, Oct. 26, 9:30 a.m.

Nonferrous Metals

Chairman—C. H. JENNINGS, Westinghouse Electric Corp., Pittsburgh
Co-Chairman—A. M. SETAPEN, Handy & Harmon, New York

Welding Aluminum with Inert Arc Direct Current, by John W. Mortimer, Whitlock Mfg. Co., Hartford, Conn.

Effect of Welding on Titanium-Carbon Alloys, by E. M. Mahla and R. B. Hitchcock, E. I. du Pont de Nemours & Co., Wilmington, Del.

Aircomatic Welding of Copper-Base Alloys, by Harold Robinson and J. H. Berryman, Air Reduction Co. Inc., New York.

Copper Alloy Brazing for Production Economy, by Clinton E. Swift and E. B. Brown, American Brass Co., Waterbury, Conn.

Pressure Vessels

Chairman—W. B. BUNN, M. W. Kellogg Co., New York
Co-Chairman—K. L. WALGER, Foster Wheeler Corp., New York

Stress Concentration Problems in Welded Construction, by G. J. Green and D. H. Marlin, Dravo Corp., Pittsburgh.

Multiple Layer Submerged Arc Welding, by L. C. Stiles and D. H. Curry, Chicago Bridge & Iron Co., Chicago.

Procedure for Fabrication of Pressure Vessels, by S. V. Williams, A. O. Smith Corp., Milwaukee.

Stainless Steel Containers to Meet Sanitary Standards, by P. H. Mounts, Cherry-Burrell Corp., Chicago.

Aircraft

Chairman—J. B. JOHNSON, Office of Air Research, USAF, Washington, D. C.
Co-Chairman—S. L. HOYT, Battelle Memorial Institute, Columbus, O.

Heliarc Welding in Production, by T. E. Piper, Northrup Aircraft Inc., Hawthorne, Calif.

Crack Sensitivity of Several Aircraft Steels, by A. W. Steinberger, B. J. DeSimone and J. Stoop, Curtiss-Wright Corp., New York.

Basic Problems in Design for Aircraft Welding, by J. Koziarski and K. B. Gilmore, Piasecki Helicopter Corp., Morton, Pa.

Jigs and Fixtures for Inert Gas Arc Welding, by H. A. Huff Jr., and A. N. Kugler, Air Reduction Sales Co., New York.

Thursday, Oct. 26, 1:00 p.m.

Inspection Trip, Electro-Motive Division, General Motors Corp., Plant No. 2

Friday, Oct. 27, 9:30 a.m.

Inert-Gas Metal-Arc Welding

Chairman—G. O. HOGLUND, Aluminum Co. of America, Pittsburgh
Co-Chairman—S. M. SPICE, Buick Div., General Motors Corp., Detroit

Aircomatic Welding of Nickel and Stainless Steels, by T. T. Watson and R. R. Rothermel, Lukens Steel Co., Coatesville, Pa.

Aircomatic Welding of Stainless Steel, by W. G. Benz Jr. and J. S. Sohn, Air Reduction Co. Inc. New York

Argon Welding Nonferrous Metals and Alloy Steels, by H. T. Herbst, Linde Air Products Co., New York

Welded Aluminum Ammonium Nitrate Prilling Tower, by H. N. Hockensmith, Brown & Root Inc., Houston.

Oxygen Cutting

Chairman—E. V. DAVID, Air Reduction Sales Co., New York
Co-Chairman—R. S. BABCOCK, Linde Air Products Co., New York

Electronically Guided Template Tracing Devices, by R. O. Fish, Fairbanks, Morse & Co., Chicago

Foundry Uses for Oxygen, Acetylene and Other Gases, by G. E. Bellew, Air Reduction Sales Co., New York

Production Shaping of Plate for Welding, by C. A. Hefferon, Linde Air Products Co., New York

Design Around a Process, by R. F. Helmkamp, Air Reduction Sales Co., New York

Locomotives and Railroads

Chairman—H. E. GANNETT, consulting railroad engineer
Co-Chairman—JOHN H. HRUSKA, consulting engineer

Fabrication of Main Line and Switcher Locomotives, by Fred T. Perry, General Electric Co., Schenectady, N. Y.

Reclamation of Diesel Locomotive Parts, by LaMotte Grover and R. L. Rex, Air Reduction Co. Inc., New York

Economy of Reclamation by Welding, by W. G. Muschler, Chicago, Burlington & Quincy Railroad, Chicago Rehabilitation of Ore Cars, by J. F. Likarish, Great Northern Railway Co., Chicago

American Welding Society

Educational Lecture Series

All Sessions at Hotel Sherman, Oct. 23-25

Chairman—DR. GILBERT E. DOAN
Presiding Officers: Monday—FRED L. PLUMMER, Hammond Iron Works, Warren, Pa. Tuesday—D. H. COREY, Detroit Edison Co., Detroit. Wednesday—J. J. CHYLE, A. O. Smith Corp., Milwaukee

Monday, Oct. 23, 4:30 p.m.

Aluminum: Properties, Design, Procedure, Inspection and Application, by G. O. Hoglund, engineer, Aluminum Co. of America, Pittsburgh

Tuesday, Oct. 24, 4:30 p.m.

Copper: Properties, Design, Procedure, Inspection and Application, by J. R. Hunter, manager, welding section research dept., Revere Copper & Brass Co. Inc., New York

Wednesday, Oct. 25, 4:30 p.m.

Nickel: Properties, Design, Procedure, Inspection and Application, by R. M. Wilson Jr., welding engineer, International Nickel Co. Inc., New York

Institute of Metals Division, AIME

PROGRAM

All Sessions at Hotel Sheraton, Oct. 23-25

Sunday, Oct. 22, 7:30 p.m.

Institute of Metals Division Program Committee Meeting

Monday, Oct. 23, 9:00 a.m.

Plastic Deformation

Chairman—B. AVERBACH

An Experimental Survey of Deformational and Annealing Processing in Zinc, by D. C. Jillson, New Jersey Zinc Co., New York

Quantitative Stress-Strain Studies on Zinc Single Crystals in Tension, by D. C. Jillson

A Study of the Plastic Behavior of High-Purity Aluminum Single Crystals at Various Temperatures, by F. D. Rosi, Sylvania Research Laboratories, New York and C. H. Mathewson, Yale University, New Haven, Conn.

A Study of Strain Markings in Aluminum, by B. R. Banerjee, Standard Oil Co. (Ind.), Chicago

Rolling Texture in Aluminum, by H. Hu and P. A. Beck, University of Notre Dame, South Bend, Ind.

Monday, Oct. 23, 2:00 p.m.

Recrystallization and Annealing Textures

Chairman—R. MADDLIN

Activation Energy for Recrystallization in Rolled Copper by B. F. Decker and D. Harker, General Electric Co., Schenectady, N. Y.

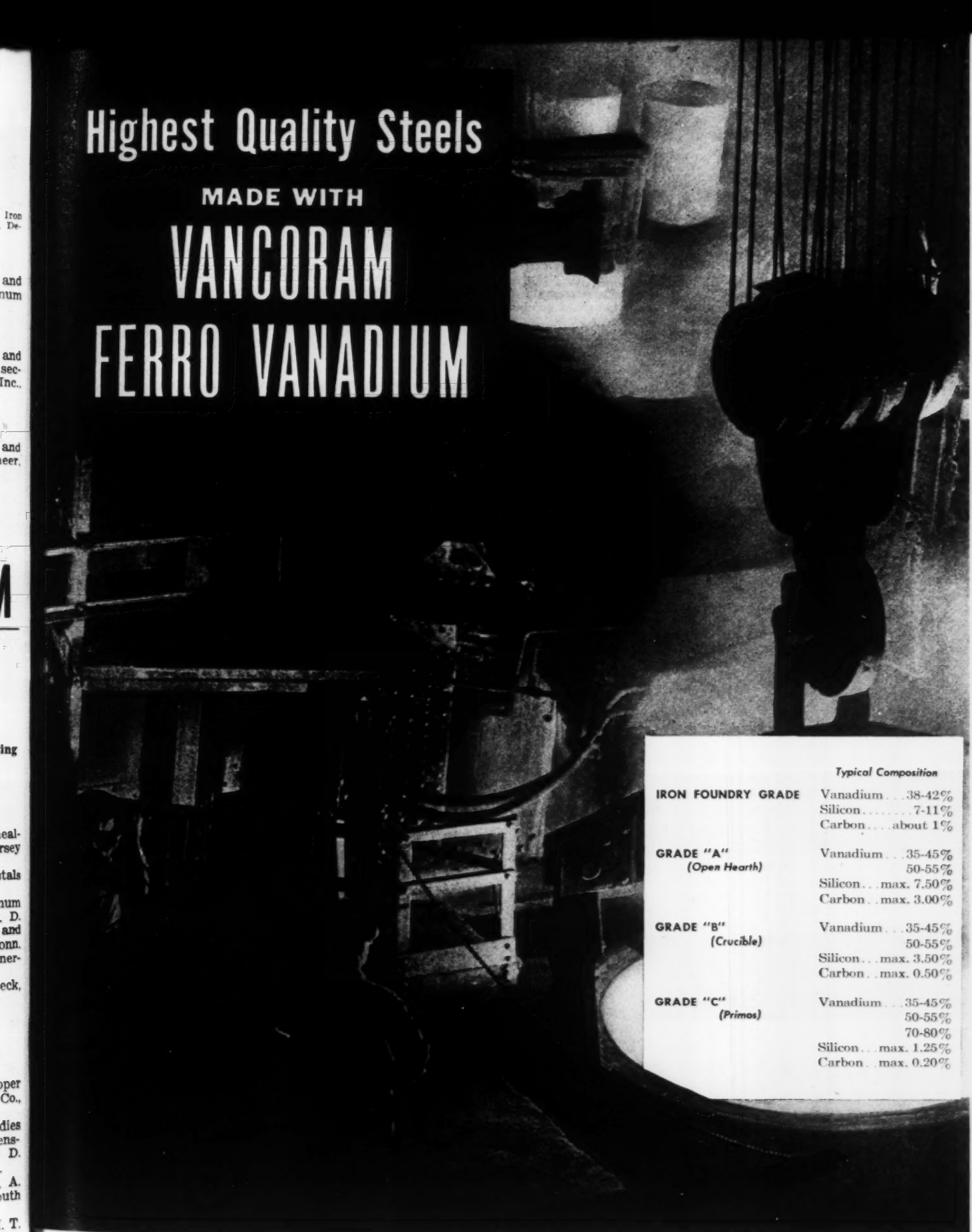
Recrystallization Reaction Kinetics and Texture Studies of a 50 Iron 50 Nickel Alloy, by W. E. Seymour, Rensselaer Polytechnic Institute, Troy, N. Y. and D. Harker, General Electric Co., Schenectady, N. Y.

Annealing Texture in Rolled Aluminum Strip, by P. A. Beck and H. Hu, University of Notre Dame, South Bend, Ind.

Textures of Cold-Rolled and Annealed Titanium, by H. T. Clark Jr., Remington Arms Co. Inc., Bridgeport, Conn.

Relative Energies of Grain Boundaries in Silicon Iron, by C. G. Dunn, F. W. Daniels and M. J. Bolton, General Electric Co., Schenectady, N. Y.

Production and Examination of Zinc Single Crystals, by D. C. Jillson, New Jersey Zinc Co., New York



	Typical Composition
IRON FOUNDRY GRADE	Vanadium . . . 38-42% Silicon . . . . . 7-11% Carbon . . . . about 1%
GRADE "A" *(Open Hearth)*	Vanadium . . . 35-45% 50-55% Silicon . . . max. 7.50% Carbon . . . max. 3.00%
GRADE "B" *(Crucible)*	Vanadium . . . 35-45% 50-55% Silicon . . . max. 3.50% Carbon . . . max. 0.50%
GRADE "C" *(Primos)*	Vanadium . . . 35-45% 50-55% 70-80% Silicon . . . max. 1.25% Carbon . . . max. 0.20%

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MAKERS OF FERRO-ALLOY

VANCORAM

CHEMICALS AND METALS

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Monday, Oct. 23, 2:00 p.m.

Structure of Alloys

Chairman—B. D. CULLITY

Solid Solubility of Cementite in Alpha Iron, C. A. Wert, University of Illinois, Urbana

Structure of Intermediate Phases in Alloys of Titanium with Iron, Cobalt, and Nickel, by P. Duwez and J. L. Taylor, California Institute of Technology, Pasadena

Alloys of Titanium with Carbon, Oxygen and Nitrogen, by R. I. Jaffee, H. R. Ogden, and D. J. Maykuth, Battelle Memorial Institute, Columbus, O.

Correlation Between Electrical and Thermal Conductivity in Ni and Ni Alloys, by M. E. Fine, Bell Telephone Laboratories, New York

Monday, Oct. 23, 4:00 p.m.

Institute of Metals Division Membership Committee Meeting

Monday, Oct. 23, 7:30 p.m.

Panel Discussion on Precipitation Hardening

Moderator—MORRIS COHEN

Panel members: B. L. Averbach, Massachusetts Institute of Technology, Cambridge; C. S. Barrett, University of Chicago; W. L. Fink, Aluminum Co. of America, Pittsburgh; A. H. Geisler, General Electric Co., Schenectady, N. Y.; A. Guinier, Conservatorie National des Arts de Metiers, Paris; J. H. Hollomon, General Electric Co. Schenectady, N. Y.; R. F. Mehl, Carnegie Institute of Technology, Pittsburgh; Cyril Stanley Smith and Clarence Zener, University of Chicago

Tuesday, Oct. 24, 9:00 a.m.

Transformations

Chairman—A. R. TROIANO

On the Martensitic Transformation at Temperatures Approaching Absolute Zero, by S. A. Kulin and M. Cohen, Massachusetts Institute of Technology, Cambridge

Austenite Formation During Tempering and its Effects on Mechanical Properties, by E. F. Bailey and W. J. Harris Jr., Naval Research Laboratory, Washington, D. C.

Isothermal Transformation of Eutectoid Beryllium Bronze, by R. H. Fillnow, Westinghouse Electric Corp., Pittsburgh, and D. J. Mack, University of Wisconsin, Madison

Ordering Reaction in Cobalt-Platinum Alloys, by J. B. Newkirk and R. Smoluchowski, Carnegie Institute of Technology, Pittsburgh, A. H. Geisler and D. L. Martin, General Electric Co., Schenectady, N. Y.

DONALD H. McLAUGHLIN
President, AIME, 1950

MAXWELL GENSAMER
Chairman, Institute of Metals

Tuesday, Oct. 24, 9:00 a.m.

Properties of Alloys

Chairman—R. M. PARKE

Effect of Alloying Elements on Plastic Properties of Aluminum Alloys, by J. E. Dorn, P. Pietrokowsky and T. E. Tietz, University of California, Berkeley

Properties of Some Mg-Li Alloys Containing Al and Zn, by R. S. Busk, D. L. Leman and J. J. Casey, Dow Chemical Co., Midland, Mich.

Effect of Sodium Contamination on Magnesium- Lithium Base Alloys, by P. D. Frost, J. H. Jackson, C. H. Lorig, Battelle Memorial Institute, Columbus, O., and A. C. Loonam, Deutsch and Loonam

Young's Modulus and its Temperature Dependence in 36 to 52 Per Cent Nickel-Iron Alloys, by M. E. Fine and W. C. Ellis, Bell Telephone Lab., New York

Hydrogen Embrittlement of SAE 1020 Steel, by J. B. Seabrook, N. J. Grant and Dennis Carney, Massachusetts Institute of Technology, Cambridge

Aging Characteristics of Magnesium-Lithium Base Alloys, by P. D. Frost, J. G. Kura and L. W. Eastwood, Battelle Memorial Institute, Columbus, O.

Tuesday, Oct. 24, 12:15 p.m.

Institute of Metals Division Executive Committee Luncheon Meeting

Tuesday, Oct. 24, 2:00 p.m.

Metal—Gas Reactions

Chairman—M. BEVER

Vapor Pressure of Silver, by H. M. Schadel Jr. and C. E. Birchenall, Carnegie Instiute of Technology, Pittsburgh

Hydrogen Solubility in Aluminum and Some Aluminum Alloys, by W. R. Opie, National Lead Co., New York, and N. J. Grant, Massachusetts Institute of Technology, Cambridge

Composition of Atmospheres Inert to Heated Carbon Steel, by R. W. Gurry, United States Steel Corp., Pittsburgh

Equilibrium in the Reaction of Carbon Dioxide with Liquid Copper from 1090° C to 1300° C, by D. J. Girardi, Timken Roller Bearing Co., Canton, O. and C. A. Siebert, University of Michigan, Ann Arbor

Intermittent Oxidation of Some Nickel-Chromium Base Alloys, by B. Lustman, Westinghouse Electric Corp., Pittsburgh

Hydrogen Elimination by Aging, by C. E. Sims, Battelle Memorial Institute, Columbus, O.

Tuesday, Oct. 24, 2:00 p.m.

Solidification, Thermal Expansion & Ductility

Chairman—R. S. BUSK

Dendritic Crystallization of Alloys, by B. H. Alexander, Sylvania Electric Products Co., New York and F. N. Rhines, Carnegie Institute of Technology, Pittsburgh.

Supercooling of Aggregates of Small Metal Particles, by D. Turnbull, General Electric Co., Schenectady, N. Y.

Thermal Expansion Characteristics of Beryllium, by R. M. Treco, Massachusetts Institute of Technology, Cambridge

Ductility of Cast Molybdenum, by R. B. Fischer and J. H. Jackson, Battelle Memorial Institute, Columbus, O.

Effect of Rate of Freezing on Degree of Segregation in Alloys, by W. T. Olsen Jr., and R. Hultgren, University of California, Berkeley

Wednesday, Oct. 25, 12:15 p.m.

Institute of Metals Division Powder Metallurgy Committee Luncheon Meeting

Wednesday, Oct. 25, 2:00 p.m.

Technical Session on Research in Progress

Co-Chairmen—M. COHEN and R. F. MEHL

On the Temperature Dependence of Self-Diffusion in Alpha Iron, by I. D. Bakalar, Massachusetts Institute of Technology, Cambridge

Effect of Uniaxial Compressive Stresses on Self-Diffusion in Alpha Iron, by F. S. Buffington, Massachusetts Institute of Technology, Cambridge

Interfaces in Diffusion in Solid Solutions, by L. C. C. da

Silva and R. F. Mehl, Carnegie Institute of Technology, Cambridge

Order-Disorder Phase Change in Cu_3Au Alloys, by F. N. Rhines, Carnegie Institute of Technology, Pittsburgh

Application of Radioactive Tracers to Study of Metal-Solution Reactions, by M. T. Simnad, Carnegie Institute of Technology, Pittsburgh

Measurements on Rate of Secondary Recrystallization in High Purity Silver, by F. D. Rosi and B. H. Alexander, Sylvania Electric Products Inc., New York

Plastic Behavior of Silver Single Crystals at Various Temperature, by F. D. Rosi, Sylvania Electric Products Inc., New York

Yielding in Plain Carbon Steels, by C. S. Roberts and B. L. Averbach, Massachusetts Institute of Technology, Cambridge

On the 259 Habit of Martensite, by E. S. Machlin, Massachusetts Institute of Technology, Cambridge

Precementitic Carbides in Tempered Martensite, by E. Roberts, Massachusetts Institute of Technology, Cambridge

Source of Abnormality in Hypereutectoid Steels, by Arthur Dube, Sylvania Electric Products Inc., New York

Wednesday, Oct. 25, 2:00 p.m.

Powder Metallurgy

Chairman—F. V. LENEL

A Process for Hot Pressing Beryllium Powder, by A. U. Seybolt, R. M. Linsmayer and J. P. Frandsen, General Electric Co., Schenectady, N. Y.

Densification of Prereduced Copper Powder Compacts in Vacuum and in Hydrogen, by C. B. Jordan and P. Duwez, California Institute of Technology, Pasadena

Experiments on Mechanism of Sintering, by B. H. Alexander and R. Balluffi, Sylvania Electric Products Inc., New York

Studies on Control of Growth or Shrinkage of Iron-Copper Compacts During Sintering, by J. F. Kuzmick, Welded Carbide Tool Co., New York and E. N. Mazza, Ekstrand & Tholand Inc., New York

Society for Non-Destructive Testing

PROGRAM

All Sessions at Morrison Hotel, Oct. 24-26

Tuesday, Oct. 24, 9:30 a.m.

Fluoroscopic Inspection of Light Metal Alloy Castings, by Justin Schneeman, president, X-Ray Products Corp., Los Angeles, and T. E. Piper, chief process engineer, Northrop Aircraft Inc., Hawthorne, Calif.

Bureau of Aeronautics Material Standards for Radiography of Aluminum and Magnesium Castings, by J. J. Pierce, chief, metallurgy & physical test section, Naval Ordnance Laboratory, White Oak, Md.

Correlation of X-Ray, Pressure Tests and Field Service on Nonferrous Castings, by Stanley A. Brosky, manager, metals section, Pittsburgh Testing Laboratories, Pittsburgh, and C. B. Johnson, Rockwell Mfg. Co., Pittsburgh

Tuesday, Oct. 24, 2:00 p.m.

Magnetic particle Inspection of Molded Pipe and Tubing, by J. E. Clarke, vice president, research, R. A. Peterson, T. Dunsheath, research engineers, Magnaflux Corp., Chicago

Tuesday, Oct. 24, 3:00 p.m.

Symposium on Magnetic Particle Testing: Wm. C. Hitt, chairman, assistant chief inspector, Douglas Aircraft Co., Santa Monica, Calif., M. B. Hoffman, methods engineer, Sawbrook Steel Castings Co., Lockland, O.; A. C. Richmond, general superintendent, Inspection Methods Research, International Harvester Co., Chicago; Charles Ziegler, chief inspector, Marion Power Shovel Co., Marion, O.

Tuesday, Oct. 24, 8:00 p.m.

Symposium on Radio-Isotopes: Dr. G. H. Tenney, chairman; Arthur I. Berman; Dr. Thomas N. White, Los Alamos Scientific Laboratory, Los Alamos, N. M.; Dr. Adair Morrison, head, Industrial Radiology Section, National Research Council, Ottawa, Canada

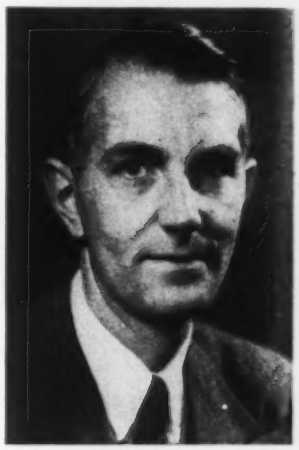
Wednesday, Oct. 25, 2:00 p.m.

Management's View of Nondestructive Testing, by John P. Magos, director of research and engineering, Crane Co., Chicago.

High Frequency Vibration tion Testing, by Robert Rawlins, head, Transonic research dept., Lockheed Aircraft Corp., Burbank, Calif., and Frank Wylie, president, Wylie Laboratories, El Segundo, Calif.

Production of Ultrasonic Images, by W. R. Turner, physics research dept., Naval Ordnance Laboratory, White Oak, Md.

Direct Visualization of Ultrasonic Images, by Dr. L. W. Ball, chief, physics research dept., Naval Ordnance Laboratory, White Oak, Md.



LESLIE W. BALL
President, SNT, 1950

Nondestructive Testing in Europe, by L. van Ouwerkerk, director, Rontgen-Technische Dienst Overschie, Netherlands

Wednesday, Oct. 25, 8:00 p.m.

Symposium on Ultrasonics: Dr. E. O. Dixon, chairman, chief metallurgical and mechanical engineer, Ladish Co., Cudahy, Wis., Dr. L. W. Ball, chief, physics research dept., Naval Ordnance Laboratory, White Oak, Md., Wm. H. Johnson, inspection dept., Allison Division, General Motors Corp., Indianapolis, Ind., Wm. C. Hitt, assistant chief inspector, Douglas Aircraft Co., Santa Monica, Calif.
(Ultrasonic equipment demonstration following the symposium)

Thursday, Oct. 26, 9:30 a.m.

Industrial and Medical Radiology Using Super Voltage X-Rays, by Dr. Denis Robinson, president, High Voltage Engineering Corp., Cambridge, Mass.

Application of the Betatron to Nondestructive Testing, by Dr. G. D. Adams, University of Illinois, Champaign

Industrial Applications of Radioisotopes, by Dr. P. C. Aebersold, chief, Isotopes Division, U. S. Atomic Energy Commission, Oak Ridge, Tenn.

Thursday, Oct. 26, 2:00 p.m.

Mehl Honor Lecture:
New Developments in Xeroradiography, by Dr. R. C. McMaster, supervisor, Electrical Engineering Division, Battelle Memorial Institute, Columbus, O.

Thursday, Oct. 26, 3:00 p.m.

Annual Business Meeting

PRODUCTS ON EXHIBIT

And Personnel in Attendance

Booth No.

Acme Mfg. Co. 218
Detroit

To Exhibit—Straight line semiautomatic polishing and buffing machines, welding positioner
Representatives—Glenn Carlson, George Carlson, Art Losey

Acme Steel Co. 623
Chicago

To Exhibit—Two models of the Acme-Morrison metal stitcher machines for fastening metal to metal or metal to nonmetallic material
Representatives—J. E. Ott, vice president; F. R. Grove, manager, stitching wire division; A. G. Denne, manager, round stitching wire department; J. H. Prout, manager, flat stitching wire department; E. P. Crim, sales engineer, wire stitching division; J. E. Borendame, sales promotion manager

Advance Heating Div., Jensen Specialties Inc. 2527
Detroit

Air Reduction Sales Co. 422
New York

To Exhibit—Aircomatic process, portable Monograph shape-cutting machine
Representatives—Air Reduction Co. Inc.: J. A. Hill, president; C. D'W. Gibson, vice president, sales; G. V. Slottman, director of research and engineering; F. J. Aschenbrenner, manager; A. Muller, R. Rothschild, W. J. Greene, G. J. Gibson, H. Robinson, W. G. Benz, J. F. Sohn, N. E. Anderson, W. Begerow, G. R. Spies, J. F. Kiernan, J. K. Hamilton, H. O. Klinke all of Air Reduction Research Laboratories; Air Reduction Sales Co. Inc. H. R. Salisbury, president; R. W. Vinke, assistant sales manager; S. D. Baumer, manager, technical sales; D. D. Spoor, manager, equipment sales; G. T. Van Alstyne, advertising manager; R. S. Schmidt, manager, dealer sales; J. F. Carroll, manager, apparatus sales; I. B. Yates, manager, arc welding sales; P. M. Mattern, assistant manager, arc welding sales; E. H. Roper, assistant manager, technical sales; J. H. Berryman, assistant manager, technical sales; E. V. David, assistant manager, technical sales; A. N. Kugler, mechanical engineer; R. F. Helmkamp, machine cutting specialist; T. H. Ayling Jr., assistant machine cutting specialist; H. A. Huff, welding specialist; L. Grover, welding engineer; G. E. Bellew, steel mill specialist; J. J. Barry, flame hardening specialist; H. O. Jones, welding specialist; E. Di Liberti, arc welding specialist; W. C. Bettes, convention manager, advertising department; C. A. McClean, advertising department; S. H. Newburn, regional manager; D. F. McCandlish, district manager; D. J. Williams, manager, railroad sales; J. F. Franzen, assistant sales manager; C. N. Sekany, sales correspondent; J. Kenefic, superintendent, railroad service; J. L. Perry, assistant manager; H. C. Opie, equipment maintenance manager; W. H. Handrock, J. O. Jordan, J. E. Campbell, R. B. Woodruff, R. R. Lincoln, P. J. Burns, salesmen; W. T. Love, D. A. Moerke, J. F. Szymczak, representatives. Milwaukee: S. H. Smith, district manager; C. F. Woelm, assistant sales manager; C. A. Nolan, technical sales supervisor. Detroit: J. H. Hart, district manager; R. A. Jamieson, assistant sales manager; C. D. Welcomb, technical sales supervisor. Cleveland: A. C. Brown Jr., regional manager; J. M. Driscoll, district manager. St. Louis: W. S. Farr, regional manager; W. P. Kellogg, district manager. Bettendorf: S. Fetter, district manager

Ajax Electric Co., Inc. 1501
Philadelphia

To Exhibit—Commercial size Ajax Hultgren salt bath brazing furnace in operation demonstrating brazing of ferrous and nonferrous assemblies
Representatives—William Adam Jr., vice president; L. B. Rosseau, assistant vice president; A. R. Yerkes, project engineer; Q. D. Mehrkam, metallurgist; E. E. Bolds, J. E. Bullock, A. A. Gustafson, O. M. Haseltine and R. D. Hawkins, sales engineers; J. B. Wollaston, technician; A. A. Baker, engineer; C. B. Mitchell, Detroit

Ajax Electrothermic Corp. 1501
Trenton, N. J.

To Exhibit—Projected color photographs of representative induction heating installations for forging work
Representatives—G. H. Clamer, president; R. N. Blakeslee, vice president, engineering; A. D. Meyer, vice president, production; F. T. Chesnut, treasurer and electrical engineer; G. F. Applegate, sales manager and secretary; J. R. Coley, assistant sales manager; W. F. Hipple, metallurgist; H. M. Rowan, electrical engineer

Ajax Engineering Corp. 1501
Trenton, N. J.

Booth No.

Aktiebolaget Kanthal 2428
Hallstahammer, Sweden and Southport, Conn.

Allen Mfg. Co. 702
Hartford, Conn.

Allison Co. 1706
Bridgeport, Conn.

To Exhibit—Rubber bonded and resinoid bonded abrasive cut-off wheels; three different types of cut-off machines, cutting both wet and dry; masonry cutting wheel
Representatives—G. J. Casserly, L. V. Wynkoop, F. W. Hoerber, C. A. Nielsen, H. R. Powell, J. D. Hough, C. D. Cummings

Alloy Engineering & Casting Co., Alloy Casting Co. Div. 1702
Champaign, Ill.

To Exhibit—High temperature heat and corrosion resistant castings showing unusual and ingenious design
Representatives—Arthur L. LaMasters, William H. Davis, Frank J. Staral, George W. Rogers, Frank W. Faery, A. D. Sutherland

Alox Corp. 2441
Niagara Falls, N. Y.

American Brake Shoe Co. 2024
New York

American Brass Co. 2002
Waterbury, Conn.

American Chain & Cable Co. Inc. 519
Bridgeport, Conn.

To Exhibit—Campbell Machine Division: abrasive cutoff machines, models No. 223 and No. 2 Hudorkut, model 2524 nibbler. Wilson Mechanical Instrument Co.: LR Tukon tester for micro and macro hardness testing, using both Knoop and 136 degree diamond pyramid indenters; MO tester for micro hardness testing using both Knoop and 136 degree diamond pyramid indenters. Accessories for both Tukon testers, hardness tester, 1JS superficial hardness tester
Campbell Representatives—V. E. Lysaght, sales manager, New York; Wm. F. Leopold, factory representative, Bridgeport, Conn.; Preston Kenyon, Detroit representative; C. H. Thompson, Cleveland representative; Paul Fee, Chicago representative; James L. Kavalaris, Indianapolis representative; Robert B. Coleman, Philadelphia representative; Otto Shettler, New York representative; Lee Horneyer Co., St. Louis representative
Wilson Representatives—V. E. Lysaght, sales manager, New York; Wm. F. Leopold, Factory representative, Bridgeport, Conn.; Preston Kenyon, Detroit representative; Paul Fee, Chicago representative; C. H. Thompson, Cleveland representative; J. L. Kavalaris, Indianapolis representative; R. B. Coleman, Philadelphia representative; Otto Shettler, New York representative; Stanley P. Rockwell Co., New England representative; Pacific Scientific Instrument Co., West Coast representative; Upton Bradeen James Co., Canadian representative

American Cyanamid Co. 1808
New York

American "Elin" Corp. 2454
New York

American Gas Association 920
New York

American Gas Furnace Co. 920
Elizabeth, N. J.

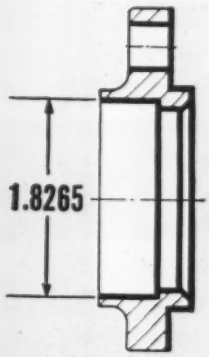
American Lava Corp. 2514
Chattanooga

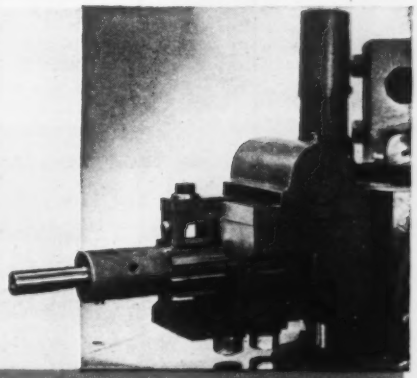
To Exhibit—AlSiMag strainer cores, cut-off cores, gate tubes, brazing jigs, insulating beads, multiple hole tubes
Representatives—John Kruesi, president; G. E. Richter, vice president in charge of sales; W. N. Brown, sales engineer

American Machine & Metals Inc. 2025
East Moline, Ill.

To Exhibit—30,000-pound capacity universal screw power testing machine, 60,000 pound model MA universal hydraulic testing machine, portable hardness testers, Clamp-O-Matic extensometer, 2 and 8-inch extensometer
Representatives—Philip Johnston, C. E. McMartin, T. M. Broughton, C. E. Petersen, Riehle sales department; F. C. Weicker, general sales manager

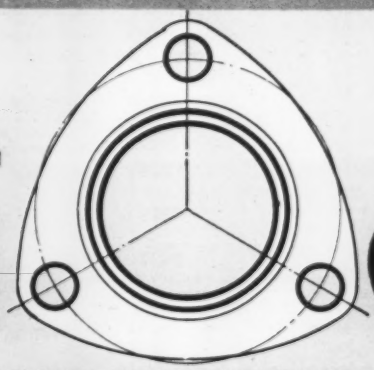
BIG SAVINGS

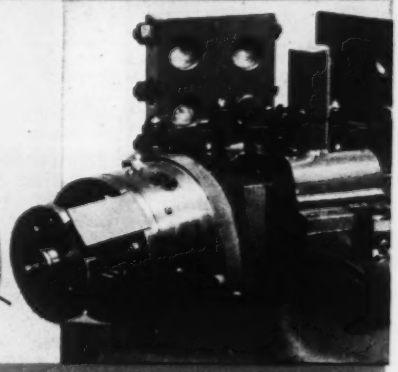




IN TIME • IN FLOOR SPACE • IN MACHINE INVESTMENT • IN LABOR COSTS

ON SMALL WORK





CASTINGS, FORGINGS AND CUT OFF BAR STOCK

WITH THE POTTER & JOHNSTON 3U AUTOMATIC

The combination of skillful P&J Tooling on the flexible P&J 3U Automatic makes this class of work most profitable. Note that the 1.8265 inch bore is larger than the diameter presented to the turret; the tool that takes the cut is the single point back boring slide illustrated in the upper photo. The lower photo shows the Multiple Spindle Drilling Attachment which indexes into exact alignment to engage with the chuck and drill the 3 flange holes simultaneously and without extra handling. Altogether, nine boring, turning, facing, beveling and drilling operations (as indicated by the heavy lines) are completed in a single chucking. Cutting cycles are fully automatic, as are all feed and speed changes; one operator easily handles a battery of 3U's, thereby spreading labor costs. Send parts or prints to P&J for tooling recommendations and detailed time estimates.

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POTTER & JOHNSTON CO.

PAWTUCKET, R. I.

subsidiary of PRATT & WHITNEY

Division Niles-Bement-Pond Company

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Booth No.

American Manganese Steel Div., American Brake Shoe Co. 2024
New York

American Nickeloid Co. 2619
Peru, Ill.

American Non-Gran Bronze Co. 2120
Berwyn, Pa.

American Optical Co., Instrument Div. 618
Buffalo

American Platinum Works 1902
Newark, N. J.

American Pullmax Co. Inc. 1714
Chicago

American Silver Co. Inc. 1824
Flushing, N. Y.
To Exhibit—Demonstration of silver brazing through use of nonferrous metals preclad with silver brazing alloy; use of inter-welded rolled gold plate; rolling of nonferrous metals, such as beryllium copper, silver, brass, Invar, etc.; fluxes and solders, including Nu-Braze Wonderflux No. 4, which forms protective coating below temperature at which heat-generated oxides form

American Steel & Iron Works 1916
Chicago

American Wheelabrator & Equipment Co. 1216
Mishawaka, Ind.

F. E. Anderson Oil Co. 2225
Portland, Conn.

Aronson Machine Co. 2427
Arcade, N. Y.
To Exhibit—Universal balanced positioners, heavy duty gear driven positioner, TracTred turning roll

E. C. Atkins & Co. 2653
Indianapolis
To Exhibit—Power hack saw blades used on a power hack saw machine, metal cutting saws

Austenal Laboratories Inc. 121
New York
See Microcast Division

Babcock & Wilcox Co. 2617
New York
To Exhibit—Allmul refractory for industrial furnaces
Representatives—A. M. Kohler, vice president; J. E. Brinckerhoff, sales manager, Refractories Division; C. L. Norton Jr., director, technical department, Refractories Division; J. D. McCullough, manager, engineering and service department, Refractories Division; Carl Claus Jr., superintendent, Refractories Works, Augusta, Ga.; F. B. Cornell, Detroit; M. J. Costello, New York; W. F. Creson, Cleveland; L. E. Flora, Chicago; G. M. Frederick, Philadelphia; A. J. Leighton, Chicago; J. W. Moffat, Pittsburgh; H. J. Shaner and R. P. Stuntz, Chicago; W. A. Stuart, Cleveland, M. J. Terman, Pittsburgh; R. M. Onan, refractories agent, Milwaukee

Babcock & Wilcox Tube Co. 2609
Beaver Falls, Pa.
To Exhibit—Samples showing various fabrications

Baker & Co. Inc. 2215
Newark, N. J.

Baldwin Locomotive Works 407
Philadelphia

Balmar Corp., N. A. Strand Division 2635
Chicago

Bausch & Lomb Optical Co. 502
Rochester
To Exhibit—Balphot metallograph
Representatives—M. H. Stevens, manager, industrial sales department; P. M. Stoehr, assistant manager, industrial sales department; L. B. McKinley, sales manager, Scientific Instrument Division; sales and engineering department personnel from Rochester, Chicago, Philadelphia and Detroit

Bede Products Inc. 2402
Cleveland

Bendix-Westinghouse Automotive Air Brake Co. 2021
Elyria, O.

Bernard Welding Equipment Co. 2638
Chicago
To Exhibit—Multi-Pic weld cleaning hammer, Shortstub electrode holder, Pro-Clamp

Beverly Shear Mfg. Co. 2623
Chicago
To Exhibit—Cable cutter, inside slotter, SS series slitting shear
Representatives—Robert Christian, George Nebel, Stanley Kalish

Black Drill Co. 722
Cleveland
To Exhibit—Drill presses showing both wet and dry drilling in hardened steel files with Hardsteel drills; air-hydraulic drilling units; hole starter and center punch which avoids breakage because of walking on ground or curved surfaces; countersinking machine, foot treadle operated

Booth No.

Representatives—F. G. Gepfert, president, J. A. Remeke, sales manager, H. J. Beck, Robert Henning, O. A. Muenz, Frank Robertson, R. B. Hogue, sales engineers

Blackstone Mfg. Co. 2552
Chicago

G. S. Blakeslee & Co. 2203
Chicago

V. A. Boker & Sons 1715
Minneapolis

Bradley Washfountain Co. 401
Milwaukee

Brainard Steel Co. 2509
Warren, O.
To Exhibit—Light weight strapping tools
Representatives—J. C. McGunnigal, general sales manager; Frank E. Houck, manager of sales, steel strapping; E. W. Bonekamp, Chicago district sales manager; A. E. Adamson and J. D. Boyer, strapping engineers

Brown Instrument Division 1802
Philadelphia

Charles Bruning Co. Inc. 2666
New York

Brush Development Co. 2536
Cleveland

Buehler Ltd. 615
Chicago
To Exhibit—1330 AB speed press for mounting metallurgical samples in plastic

Bundy Tubing Co. 507
Detroit

By-Products Steel Co. Div., Lukens Steel Co. 1625
Coatesville, Pa.

Campbell Machine Division, American Chain & Cable Co. Inc. 519
See American Chain & Cable Co. Inc.

Casting Engineers Inc. 2648
Chicago

Champion Rivet Co. 1830
Cleveland
To Exhibit—Gray Devil H. P. and Black Devil electrodes which feature fast burn-off rate, high deposition rate, and efficiency; model arc welding electrode extrusion production line; various upset forgings
Representatives—T. P. Champion, president; T. J. Lawless, vice president, sales; R. J. Champion, welding engineer; D. J. Champion, Cleveland sales; D. J. Schaefer, technical sales engineer; C. L. Shipley, Western sales manager; H. W. Donahey, Chicago sales-welding engineer; E. Markert, Western plant manager; T. J. Kegg Jr.; Texas sales; P. Peterson and R. E. Mann, Chicago sales

Chicago Metal Hose Corp. 714
Maywood, Ill.

Chicago Rivet & Machine Co. 2628
Bellwood, Ill.
To Exhibit—No. 53 automatic rivet setter, automatic rivet setters setting single as well as multiple, and with adjustable centers
Representatives—E. J. Morrissey, sales manager; William Shineflug, sales engineer; W. M. Fahey, representative; C. H. Reineck; C. S. Barans, L. Grace, A. B. Schroer, R. J. Kennedy, Joseph A. Rehm

Chicago Screw Co. 2627
Bellwood, Ill.

Chicago Steel Foundry Co. 2003
Chicago

Cincinnati Milling & Grinding Machines Inc. 2534
Cincinnati

Cities Service Oil Co. 1903
New York

Clayton Mark & Co. 2542
Evanston, Ill.

Cleveland Industrial Tool Co. Inc. 2421
Cleveland

Climax Molybdenum Co. 1724
New York

Clinton Machine Co. 201
Detroit

Coles Cranes Inc. 1110
Chicago
To Exhibit—Model S810 gasoline electric machine crane fitted with 26-foot boom and equipped for magnet operation
Representatives—G. M. Bassnett, president

Combustion Control Corp. 1231
Cambridge, Mass.
To Exhibit—Fireye multiple scanner gas oven flame failure control which accommodates up to four Firetron scanners with single relay control; Fireye programming control with Firetron scanner for automatic and manually ignited gas burners
Representatives—L. D. Sibley, general sales manager; S. J. Pachyn, assistant sales manager; Henry Christiansen, midwest sales manager

Booth No.

Commander Mfg. Co. 402
Chicago

To Exhibit—Model 900 Multi-Drill in drilling and tapping operations controlled by a Beckett-Harcum drill press feed
Representatives—J. B. Chamberlain and L. R. Chamberlain, partners; F. J. O'Laughlin, sales manager

Commercial Shearing & Stamping Co. 2115
Youngstown

Consolidated Engineering Corp. 2436
Pasadena, Calif.

To Exhibit—Type 5-116 recording oscillograph, employing 1 to 9 or 1 to 14 channels; type 1-118 carrier amplifier known as recording measurement system E for use with strain-gage bridges or transducers; type 4-103 velocity pickup for operation at ambient temperatures from 150° F to 250° F
Representatives—George H. West, director of advertising; R. E. Lockard, materials testing sales engineers; Cyrus J. Underwood, L. P. Robinson, H. W. Ruby, and Rex Welch, sales engineers; Milton Chester, engineer

Continental Industrial Engineers Inc. 925
Chicago

To Exhibit—Customer products from metal, ceramic, glass, chemical, building materials, plastic and refining industries
Representatives—W. A. Darrah, president; R. A. Hastings, vice president; T. W. Allsworth, chief engineer; C. P. Masure, purchasing agent; H. L. Wentworth, assistant chief engineer; D. C. Nicely, project engineer; W. G. Wilson, chief draftsman

Contour Marker Corp. 1803
Compton, Calif.

Cooley Electric Mfg. Corp. 2647
Indianapolis

Copress Corp. 1715
Norwalk, Conn.

Crane Packing Co. 2106
Chicago

To Exhibit—Tube rolling control for condenser and heat exchangers, Lapmaster lapping machine
Representatives—F. E. Payne, president; K. V. Rohlen, executive vice president; S. Hawxhurst, assistant to the president; H. I. Sole, manager, Lapmaster Division; F. L. White, development, Lapping Division; H. L. Asp, sales manager; V. E. Vorhees, sales manager, Seal Division; R. J. Brown, advertising manager

Cyc-Arc Ltd. 2654
London, England

Dake Engine Co. 1210
Grand Haven, Mich.

Delaware Tool Steel Corp. 2624
Wilmington, Del.

To Exhibit—Scale model of Delaware controlled atmosphere furnace
Representatives—S. N. Levy Jr., metallurgist; William B. Levy, plant engineer

Delta Power Tool Div., Rockwell Mfg. Co. 2701
Milwaukee

Department of the Navy 2903
Washington, D. C.

Despatch Oven Co. 2747
Minneapolis

To Exhibit—DF line of laboratory furnaces with temperature range to 850° F, in various sizes, gas or electric heated

Detrex Corp. 2222
Detroit

To Exhibit—Gyro degreaser with rotary internal conveyor for handling of work through a vapor-spray-vapor or a vapor-immersion-vapor cleaning cycle rotary drum washer, rust-proofing compounds and alkaline and emulsion cleaners
Representatives—E. H. Ehlert, Chicago region manager; L. Camel, sales manager; W. F. Newbery, director of sales; G. W. Walter, advertising manager

Detroit Testing Machine Co. 314
Detroit

Representatives—Ralph Campbell; William R. Campbell; Vincent Van Laan

Harry W. Dietert Co. 823
Detroit

Distillation Products Industries Div., Eastman Kodak Co. 719
Rochester, N. Y.
See Eastman Kodak Co.

Diversey Corp. 619
Chicago

To Exhibit—Aluminux alkaline etching compound for all aluminum alloys, No. 909 soak tank metal cleaner, No. 36 aluminum cleaner, No. 12 reverse current cleaner for various metals, process for preparing aluminum and its alloys for spot welding

DoAll Co. 606
Des Plaines, Ill.

To Exhibit—Line grinding method of machining hardened steel, hydraulic production cut-off machine, cool grinding with precision surface grinders, high speed production band machine
Representatives—DoAll Co.: L. A. Wilkie, chairman of the board; R. J. Wilkie, president; J. W. Wilkie, treasurer; L. R. Rothenberger, general sales manager; C. H. Rosene, director of public relations; H. Pottle, J. Spooner, K. C. Glader, J. T. McRae, sales managers; G. H. Sheppard, J. Harrington, L. Cruise, research engineers. DoAll Midwest Co.: A. G. Mather, J. M. Galvin, R. J. Otey, R. L. Somers, J. G. Typner, F. J. Whelan, engineers

Booth No.

Dow Furnace Co. 2735
Detroit

Dreis & Krump Mfg. Co. 1620
Chicago

Wilbur B. Driver Co. 115
Newark, N. J.

To Exhibit—Nickel chrome and copper nickel alloys supplied to electric heating and electronic industries; Tophet automatic coiling machine for winding helical coils of resistance alloys automatically, cutting the coils to the resistance required
Representatives—Norman P. Norlie, Western manager; Sidney A. Wood, vice president, sales; Raymond O. Hallberg, sales manager

E. I. Du Pont de Nemours & Co., Inc. 1602
Wilmington, Del.

To Exhibit—(Electrochemical Department): Operating models of vapor degreasing with trichlorethylene, metal descaling with sodium hydride descaling process. Pigments Department: Titanium metal, ilmenite ore, sponge metal, 500 pound ingot, slabs, rods, sheets, etc., titanium fabrications
Representatives—Chlorine Products Division: C. B. Shepherd, P. R. Hendrixson, A. P. Stetser. Sodium Products Division: H. L. Alexander, H. L. Benner, G. L. Dorough, F. J. Holt, W. R. Huey. Pigments Department: R. S. Radcliffe, J. Barth, E. A. Gee, W. E. Lusby

Du-Wel Metal Products Inc. 1715
Bangor, Me.

Eastman Kodak Co. 719
Rochester, N. Y.

To Exhibit—Etching machine used to produce better specimens for photomicrography, pneumatically operated quarter-swing high vacuum valves, combination Philips and Pirani gage for measuring pressures in the range of from 1000 microns down to 2 x 10^{-5} Hg
Representatives—F. M. Jenner, vacuum equipment department manager; A. H. Hartman, vacuum equipment sales manager; Dr. G. H. Bancroft, development engineer; William F. Dolke, Rochester sales territorial representative; Tom Comer, Chicago sales territorial representative; R. R. Cyr, West Coast sales territorial representative

Eclipse Fuel Engineering Co. 927
Rockford, Ill.

Ekstrand & Tholand Inc. 423
New York

Representatives—N. K. Tholand, president; E. C. Kenney, vice president; E. Mazza and T. Dwyer, engineers

Elastic Stop Nut Corp. of America 123
Union, N. J.

To Exhibit—Elastic stop nuts, Rollpins
Representatives—E. F. Nason, general sales manager; D. E. Lally, assistant general sales manager; Bruce F. Linck, sales promotion manager; C. E. Heywood, field service engineer; Howard Peters, Rollpin engineer; C. W. Dean, R. S. Thompson and R. F. Fettig, district managers; H. B. Schultz and D. B. Sorenson, sales engineers

Electric Furnace Co. 1011
Salem, O.

To Exhibit—Illustrations of various types of equipment made and installed by the company
Representatives—K. U. Wirtz, president; F. T. Cope, general manager; C. L. West, vice president; C. H. Vaughan, assistant vice president; N. H. Knowlton, W. F. Ross, F. T. Cope Jr., E. L. Kerr, D. A. Reichert, A. R. Juhn, B. J. Aurin, sales engineers; J. R. Moore, assistant chief engineer; J. B. Arter, chief draftsman, G. P. Lozier, superintendent; W. Albertsen, assistant superintendent; H. W. Smith, production manager; H. W. Yeagley, design engineer; R. M. Warren, purchasing agent; R. J. Perrine, research engineer; D. Ashead, chemist; A. H. Vaughan, chief engineer; F. R. Mathews, electrical engineer; A. F. Kingsley and J. W. Holzwarth, engineers; A. E. Wright, advertising manager

Electro-Alloys Div., American Brake Shoe Co. 2024
Elyria, O.

Elgin National Watch Co. 318
Elgin, Ill.

To Exhibit—Dymo diamond compound with precision graded suspended diamond particles, Elgiloy alloy with properties of resistance to corrosion, set and fatigue
Representative—John F. Ireland, sales manager

Elox Corp. of Michigan 2407
Clawson, Mich.

Engineered Castings Div., American Brake Shoe Co. 2024
Rochester, N. Y.

Eutectic Welding Alloys Corp. 2202
New York

To Exhibit—EutecTrodes for arc and gas applications; demonstrations performed in five welding booths
Representatives—Rene D. Wasserman, president; Fred F. Roehll, national sales manager; Seymour Barnes, laboratory assistant; R. H. Groman, regional manager, Illinois; Paul Miller,

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Booth No.

district engineer, Greater Chicago; T. C. Fair, district engineer, Chicago area; E. H. Mayer, district engineer, South Chicago; and J. A. Gersten, district engineer, Peoria

Farmers Engineering & Mfg. Co. 2723
Pittsburgh

Fawick Airflex Co. Inc. 1521
Cleveland

R. Y. Ferner Co. 214
Boston

To Exhibit—Vickers projection microscope, bench type metallurgical microscope, photomicrographic camera assembly, polarizing microscope for metallurgy (opaques) optical clinometer, Schenck, 6-ton fatigue testing machine in operation, portable brinell hardness outfit, brinell pocket microscope, Singer micro manipulator

A. Finkl & Sons Co. 1911
Chicago

Fisher Scientific Co. 2753
Pittsburgh

To Exhibit—Induction carbon apparatus for rapid carbon determinations in all types of ferrous materials, portable electronic Steelsorter instrument which distinguishes between steel sections by measuring magnetic properties

Foster Transformer Co. 2465
Cincinnati

To Exhibit—Remote control for DC arc welding, including new design for use with gas or diesel driven equipment

Fostoria Press Steel Corp. 718
Fostoria, O.

To Exhibit—Infra-red Evenray equipment
Representatives—E. L. Bates, I. J. Barber, R. W. Jeffery, P. H. Krupp, P. L. Jones, E. L. Goble, W. F. Carlin, E. R. Follin

THE FOUNDRY 1925
Cleveland

Representatives—Frank G. Steinebach, editor; Edwin Bremer, metallurgical editor; A. W. Johansen and R. Z. Chew Jr., Chicago, business staff

Gamma Scientific Co. 418
Great Neck, N. Y.

Gas Appliance Service Inc. 920
Chicago

General Alloys Co. 906
Boston

General Aniline & Film Corp. 1527
Johnson City, N. Y.
See Ozalid Division

Goldsmith Bros. Smelting & Refining Co. 2419
Chicago

B. F. Goodrich Co. 2007
Akron, O.

Claud S. Gordon Co. 925
Chicago

To Exhibit—Gordon-Campbell core hardness tester
Representatives—C. S. Gordon; Vincent Manka; D. E. Howell; W. J. Hammond; H. L. Campbell

H & H Tube & Mfg. Co. 1707
Detroit

William J. Hacker & Co. Inc. 2453
New York

To Exhibit—Reichert's universal metallurgical camera microscope MeF, made by C. Reichert Optical Works, Vienna, Austria
Representatives—A. Benzemann; William J. Hacker, president

Hamilton Mfg. Co. 2727
Two Rivers, Wis.

Handy & Harman 1606
New York

To Exhibit—Joining of ferrous and nonferrous metals with the silver brazing alloys Easy-Flo and Sil-Fos
Representatives—J. W. Colgan, vice president and sales manager; M. W. Townsend, assistant sales manager; F. T. Van Syckel, advertising manager; G. J. Van Haste, assistant advertising manager; A. M. Setapen, manager, engineering division; J. O. Powers, director training; P. L. Heding, A. W. Swift and R. J. Metzler, sales engineers, K. G. Smykal, all of New York; M. C. Robbins, sales engineer, Cleveland; E. H. Smith, sales engineer, Detroit; F. Petrie, engineer, Bridgeport; P. G. Feld, R. G. Tilley, H. H. Olson, P. G. Deuchler, sales engineers, Chicago

Harnischfeger Corp. 208
Milwaukee

Harper Electric Furnace Corp. 2554
Niagara Falls, N. Y.

C. I. Hayes Inc. 306
Providence, R. I.

Booth No.

Haynes Stellite Div., Union Carbide & Carbon Corp. 301
New York

To Exhibit—Demonstration of mechanized hard-facing by oxy-acetylene process; plastic patterns used in production of precision-investment castings; hard-facing materials; metal-cutting tools, corrosion-resistant alloys; high-temperature alloys

Heli-Coil Corp. 2442
Long Island City, N. Y.

Heppenstall Co. 2634
Pittsburgh

Hesse Machine & Mfg. Co. 2415
West Hartford, Conn.

Hevi Duty Electric Co. 1931
Milwaukee

Hitchiner Mfg. Co. Inc. 2415
Manchester, N. H.

Holcroft & Co. 614
Detroit

To Exhibit—Pictures, catalogs and reprints covering modern heat treating equipment
Representatives—R. T. Cadwell, president; W. H. Holcroft, executive vice president; R. H. Cadwell, treasurer; B. E. French, G. C. Wilsher, C. L. Joy, R. C. Crans, J. T. Jans, D. A. Blair, J. H. Bradley, A. Walker, engineers; E. C. Bayer, H. J. Hammond, M. R. Larson, D. J. Schwaim, metallurgists, all of Detroit; C. H. Martin, vice president; A. A. Engelhardt, engineer; G. P. Stark, field engineer, all of Chicago; J. A. Sinclair, engineer, Houston, Texas; W. F. Schott, engineer, Cleveland

Charles A. Hones Inc. 1029
Baldwin, N. Y.

E. F. Houghton & Co. 728
Philadelphia

To Exhibit—Electric salt bath furnaces for preheating and martempering, new type of fast quenching oil
Representatives—D. J. Richards, vice president, sales; A. A. Miller, sales manager, Chicago Division; James McElgin, manager, metal working sales; J. C. Rovaldi, metal working technical specialist; D. C. Miner, advertising manager; E. G. Irwin, Reese Nelson, W. McManus, F. L. Townsend, R. M. Gerling, C. C. Gaynes, A. J. Andre, D. R. Richards Jr., C. S. LaTour, F. J. Colligan, sales representatives

Howard Foundry Co. 101
Chicago

Hydropress Inc. 2717
New York

To Exhibit—Marform process

Illinois Testing Laboratories Inc. 819
Chicago

Industrial Products Div., Elgin National Watch Co. 318
Elgin, Ill.
See Elgin National Watch Co.

Industrial Southern California 815
Los Angeles

International Nickel Co. Inc. 1107, 1120
New York

To Exhibit—Properties and uses of such nickel alloys as stainless steels, engineering alloy steels, engineering cast irons, Ni-Hard, Ni-Resist, nickel bronze, nickel silver and cupro-nickel; plating, ferronickel alloys and heat and corrosion-resistant applications; ductile iron; platinum metals; Monel, Inconel and other high nickel alloys with emphasis on the applications of Inconel and Inconel X for high temperature service; welding materials, including Ni-Rod for making machinable welds in cast iron; samples of sand and precision castings

Interstate Machinery Co. 1206
Chicago

Ipsen Industries Inc. 715
Rockford, Ill.

To Exhibit—T-250 automatic heat treating unit, 500 endothermic generator
Representatives—H. N. Ipsen, president; R. W. Krogh, metallurgist; Roy L. Prang, M. C. Schwer, representatives

Jarrell-Ash Co. 129
Boston

Jensen Specialties Inc. 2527
Detroit

S. C. Johnson & Son Inc. 2544
Racine, Wis.

To Exhibit—Results on various metals obtained with corrosion inhibiting wax
Representatives—James B. Carse, sales manager, industrial products department; Robert L. Papp, industrial waxes merchandiser

C. Walker Jones Co. 2121
Philadelphia

To Exhibit—Line of work gloves including Jomac heat and flame resistant gloves
Representatives—C. Walker Jones, H. E. Eldridge, C. M. Mehaffie, D. D. Trimble

K S M Products Inc. 2733
Merchantville, N. J.

To Exhibit—Arc welding studs with arc shields, stud welding equipment
Representatives—Frank K. Kelemen, general manager; Joseph Kelemen, production manager; Rex A. Taylor, sales manager; Edwin F. Kellan, Anthony Maladra and Lawrence P. English, district engineers; R. Kenneth Ritter, junior sales engineer; Cornelius Aarts, consulting engineer

WHITCOMB *Hydro Motive*

Whitcomb 25-Ton Diesel Hydro-Motive Locomotive handles a train of hot metal ladles at the open hearth of Crucible Steel Company of America.

MEANS . . .

- **LOWER MAINTENANCE COSTS**
- **LONGER LOCOMOTIVE LIFE**
- **EASIER OPERATION**
- **SMOOTHER HANDLING**

MOVES MORE MATERIALS, LONGER, FOR LESS

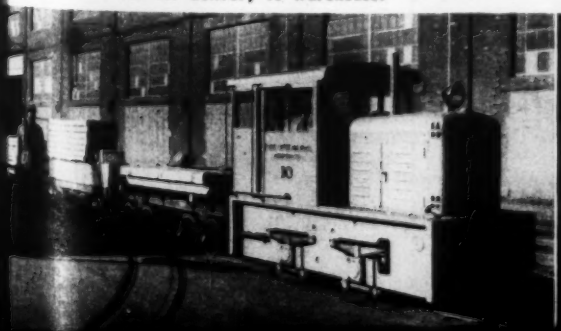
The Whitcomb Hydro-Motives give you greater value *every* way. You get the smooth-flowing power of an electric drive at far less cost with a Whitcomb Hydro-Motive. And maintenance costs are lower, too, because wearing, jarring road bed shocks are *not* transmitted to the engine. Instead the jolts are absorbed in the fluid coupling of Whitcomb's Hydro-Motive. Thus, locomotive wear is cut down, locomotive life lengthened.

But economy is only one advantage of the Whitcomb Hydro-Motives. They reduce operator-fatigue, reduce accident risks, because there is no lunging, no shifting — power is smooth, instant, uniform at any speed.

And the Hydro-Motive locomotive is every inch a Whitcomb — which means the finest in engineering, in materials, in workmanship. Replace your present outdated locomotives with smooth, new Whitcomb Hydro-Motives.

Write today for complete information on Whitcomb Hydro-Motive Locomotives, in sizes from 10 to 40 tons.

At eastern copper plant an 8-ton Diesel picks up loaded car for delivery to warehouse.



Whitcomb 20-ton Diesel mechanical locomotive of a type widely and profitably used in steel-making.

There is no power more economical than Diesel; no Diesel locomotive finer than a Whitcomb.

THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILLINOIS

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

1950 Metal Show

MATERIALS AND EQUIPMENT FOR HIGH PRODUCTION

Booth No.

Kalamazoo Tank & Silo Co. 1210
Kalamazoo, Mich.

Kanthal Corp. 2428
Southport, Conn.

To Exhibit—Heating elements for laboratory type electric furnaces
Representatives—Alfred Rapp, director of sales, A. B. Kanthal, Hallstahammar, Sweden; Erik Hagglund, executive vice president, Kanthal Corp., Southport, Conn.

Kellogg Div., American Brake Shoe Co. 2024
Rochester, N. Y.

C. M. Kemp Mfg. Co. 1227
Baltimore

Kennametal Inc. 808
Latrobe, Pa.

To Exhibit—Demonstration of how Kentanium (essentially titanium carbide) resists oxidation, retains high strength at elevated temperatures and withstands thermal shock; display of Kennametal tools for metalworking, mining construction, and woodworking

L. R. Kerns Co. 2122
Chicago

Andrew King 706
Narberth, Pa.

Kold-Hold Co. 2208
Lansing, Mich.

William Korn Inc. 2602
New York

Kux Machine Co. 2212
Chicago

To Exhibit—Model HP-37 die casting machine, cold chamber type, for production of aluminum, brass and magnesium castings, 600 tons die locking pressure; model K-10 cold chamber die casting machine, for production of aluminum castings, 25 tons die locking pressure; model 65B automatic powdered metal press producing metal powder compacts, 75 tons pressure

Laboratory Equipment Corp. 2726
St. Joseph, Mich.

To Exhibit—High frequency induction furnace
Representatives—Carl E. Schultz, president; George Krasl, secretary; Joseph Sauer, treasurer; Charles Schultz, plant manager; H. J. Schmitt, sales manager; O. Siewert, P. Molloy, field engineers

Lapeer Mfg. Co. 2453
Lapeer, Mich.

To Exhibit—Model AO-200 and AO-400 air-operated clamps
Representatives—James A. Herrington, president; Fred Lampe, chief engineer; Charles Kaiser, sales manager

Leeds & Northrup Co. 1624
Philadelphia

To Exhibit—Air-fuel ratio controller, Homocarb carburizing furnace with Microcarb carbon control, foundry sand weighing with Speedomax recorder, immersion thermocouple pyrometer for open hearth bath temperature, roll temperature recording equipment

Lempco Products Inc. 2460
Bedford, O.

Lepel High Frequency Laboratories Inc. 2221
New York

Leslie Welding Co. 2741
Chicago

Lewis Machine Co. 2610
Cleveland

To Exhibit—No. 8-F travel-cut wire straightening and cutting machine, special No. 2-C short-cut wire straightening and cutting machine
Representatives—Carl B. Jones and Charles Gardiner, Steel & Wire Machinery Co., Cleveland, western representatives; George M. Hessdoerfer, Penn Machinery Co., Philadelphia, eastern representatives; Gus Sohl, Moslo Machinery Co., Cleveland, central representatives; M. Samuel, Empire Engineering Co., Toronto, Ontario, Canadian representatives

Lincoln Electric Co. 1201
Cleveland

Lindberg Engineering Co. 1204
Chicago

Lindberg Steel Treating Co. 2015
Chicago

Linde Air Products Co. 901
New York

Lipe-Rollway Corp. 2549
Syracuse, N. Y.

Liquid Carbonic Corp. 1815
Chicago

Lithium Co. 2719
Newark, N. J.

Lord Mfg. Co. 1807
Erie, Pa.

To Exhibit—Vibration-control mountings of many sizes and types, including Temproof mountings which are not affected by extremes of temperature, and Radiofocal mounting bases for JAN-C-172A base mounted electronic equipment; bonded rubber (rubber-bonded-to-metal) component parts designed to specific requirements of manufacturers, animated demonstration of vibration-control
Representatives—G. E. Tubb, general sales manager; C. L. Freel, manager, field engineering; R. C. Henshaw, manager, product and sales engineering; G. H. Billman, product and sales engineering department; G. E. Frutchey, A. R. Stokke, E. C. Vallin and R. T. Daily, field engineering representatives; R. M. Kilpatrick and J. H. Morris, product and sales engineering department; F. B. Moore, sales division

Los Angeles Chamber of Commerce 815
Los Angeles

Lukens Steel Co. 1625
Coatesville, Pa.

Lynchburg Foundry Co. 2517
Lynchburg, Va.

To Exhibit—Castings showing the different types of work produced, photographs showing facilities of both plants, and large castings produced at Radford plant

MACHINE DESIGN 1925
Cleveland

Representatives—Colin Carmichael, editor; John W. Greve, managing editor; Benjamin L. Hummel, associate editor; R. L. Hartford, business manager; H. B. Veith, Cleveland, H. H. Dreyer and R. K. Lotz, Chicago business staff

Magnaflux Corp. 2012
Chicago

To Exhibit—Nondestructive tests in operation; conveyorized, semiautomatic, high production Magnaflux unit using Duovec to magnetize parts in two directions simultaneously, one operation completing inspection; Magnaflux KH-05; Zyglo process for nonmagnetic materials; Statiflux and Partek for nonmetals and powdered metal compact inspection; Sonizon ultrasonic thickness instrument; Stresscoat brittle coating for experimental stress analysis

Magnetic Analysis Corp. 1920
Long Island City, N. Y.

D. E. Makepeace Co. 1732
Attleboro, Mass.

Manhattan Rubber Div., Raybestos-Manhattan Inc. 2130
See Raybestos-Manhattan Inc.

Marlie Trading Inc. 2249
See Tyler Mfg. Co.

Martindale Electric Co. 1811
Cleveland

To Exhibit—Mica-Miller undercutter for mica on commutators
Representatives—R. E. Biersch, tools specialist; B. Selleg and J. J. Rick, sales representatives

Marvin Machine Products Inc. 1210
Detroit

Master Builders Co. 2547
Cleveland

Material Handling Div., Jensen Specialties Co. Inc. 2527
Detroit

Merrill Bros. 416
Maspeth, N. Y.

Metal Parts & Equipment Co. 1514
Chicago

Metal Products Sales Co. 2415
West Hartford, Conn.

Michiana Products Corp. 2618
Michigan City, Ind.

To Exhibit—Line of heat, corrosion and abrasion resistant alloy castings
Representatives—J. H. Staiger, L. P. Bensing, C. Q. Swenson, H. E. Ardahl, E. J. Sundin, A. J. Popovich, salesmen

Microcast Division, Austenal Laboratories Inc. 121
New York

To Exhibit—Microcastings with smooth surfaces, close tolerances and sound structure in alloys ranging from high temperature to carbon steels
Representatives—New York office: A. W. Merrick, chief metallurgist; R. L. Wiseman, sales manager; W. W. Troupp, E. L. White Jr., sales representatives. Rockaway office: J. J. Erdmann, general manager. Chicago office: Dr. P. F. Collins, assistant general manager; J. M. Uhle, sales representative

Miller Electric Mfg. Co. 1731
Appleton, Wis.

To Exhibit—Hydraulically controlled Heliarc welder with provision for rapid amperage changes; model AEA-200-L welder and power plant; AC transformer welders; DC welders; spot welders
Representatives—N. C. Miller, president; C. B. Abel, sales manager; A. C. Mulder, plant manager; W. L. Sykes, chief electrical engineer; G. K. Willecke, physicist; B. R. Baker, F. H. Beck, W. H. Siefferman, Marion Selser, C. J. Bocklet, R. A. Metcalf, district managers

A. Milne & Co. 2448
New York

Minneapolis-Honeywell Regulator Co. 1802
Philadelphia

(*Please turn to Page* 159)

How does the size (BIG) and experience (LONG) of TOWNSEND benefit you?

Many visitors to the Townsend plants are surprised at our big organization. As they walk through more than 15 acres of a variety of busy machines they marvel at the steady stream of rivets, gadgets, small parts, special nails and fasteners pouring from these modern cold-headers. They see we have enough machines of any one type to handle large and small orders with equal efficiency. This is demonstrated by the fact that 800 employees in our plants at New Brighton and Chicago turn out *sixty-million* cold-headed items in a normal working day.

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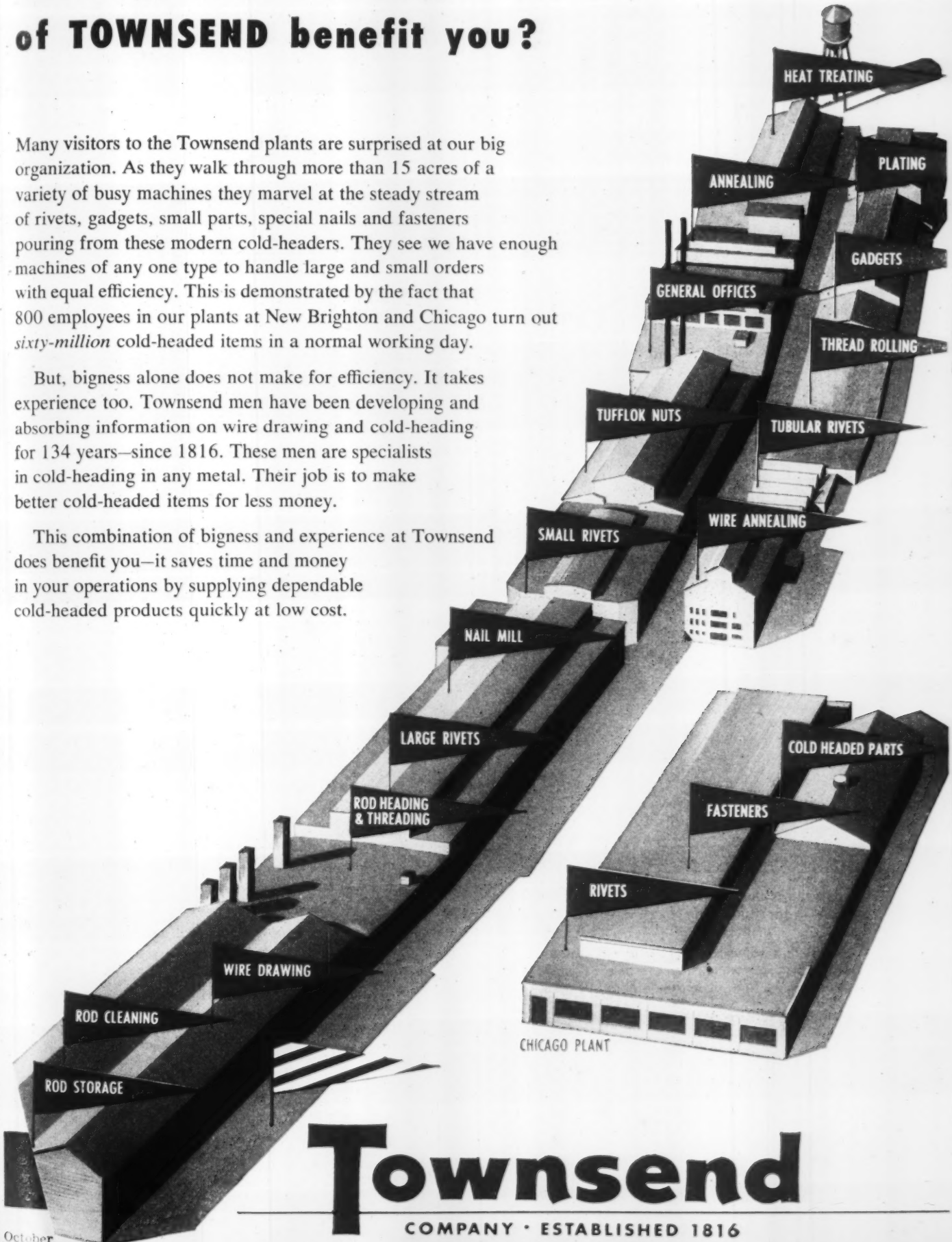

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Stud Welded Open Hearth Doors Minimize Production Losses

By ROBERT C. SINGLETON
Manager of Industrial Sales
Nelson Stud Welding Division
Morton Gregory Corp.
Lorain, O.

One ton of steel is lost every time a furnace door is changed. New technique of supporting rammed mix extends charging door life saving both labor and fuel

RECENT developments in open-hearth door design which combine use of plastic chrome ores and end-welded studs prove that this combination is excellent for certain types of open-hearth furnaces. In one open-hearth shop in the Chicago area a close study of both brick doors and studded and rammed doors showed that the rammed doors result in cost savings of better than $35,000 during a period of one year, and that the 11 furnaces involved are able to increase their production by more than 2500 tons during the same period.

Although all open-hearth doors were originally designed for use with bricks of various sizes and shapes, many shops have changed to a door designed for use with a chrome ore ram mix. Regardless of the type door used, end-welded studs proved an extremely satisfactory means of supporting the ram mix.

Takes More Heats—This mix is usually a neutral refractory material made of iron and chrome ores with a water glass or sodium silicate binder. When properly rammed and cured, doors made with this material are capable of withstanding more than enough heats to counter the increased initial cost of this type of door when compared to brick doors.

Many operators found that on a strictly cost per door per heat basis, studded and rammed doors are less expensive, have the added advantage of lowering labor costs and keeping production losses during door changes to a minimum.

The solid back or tank type door is the most com-

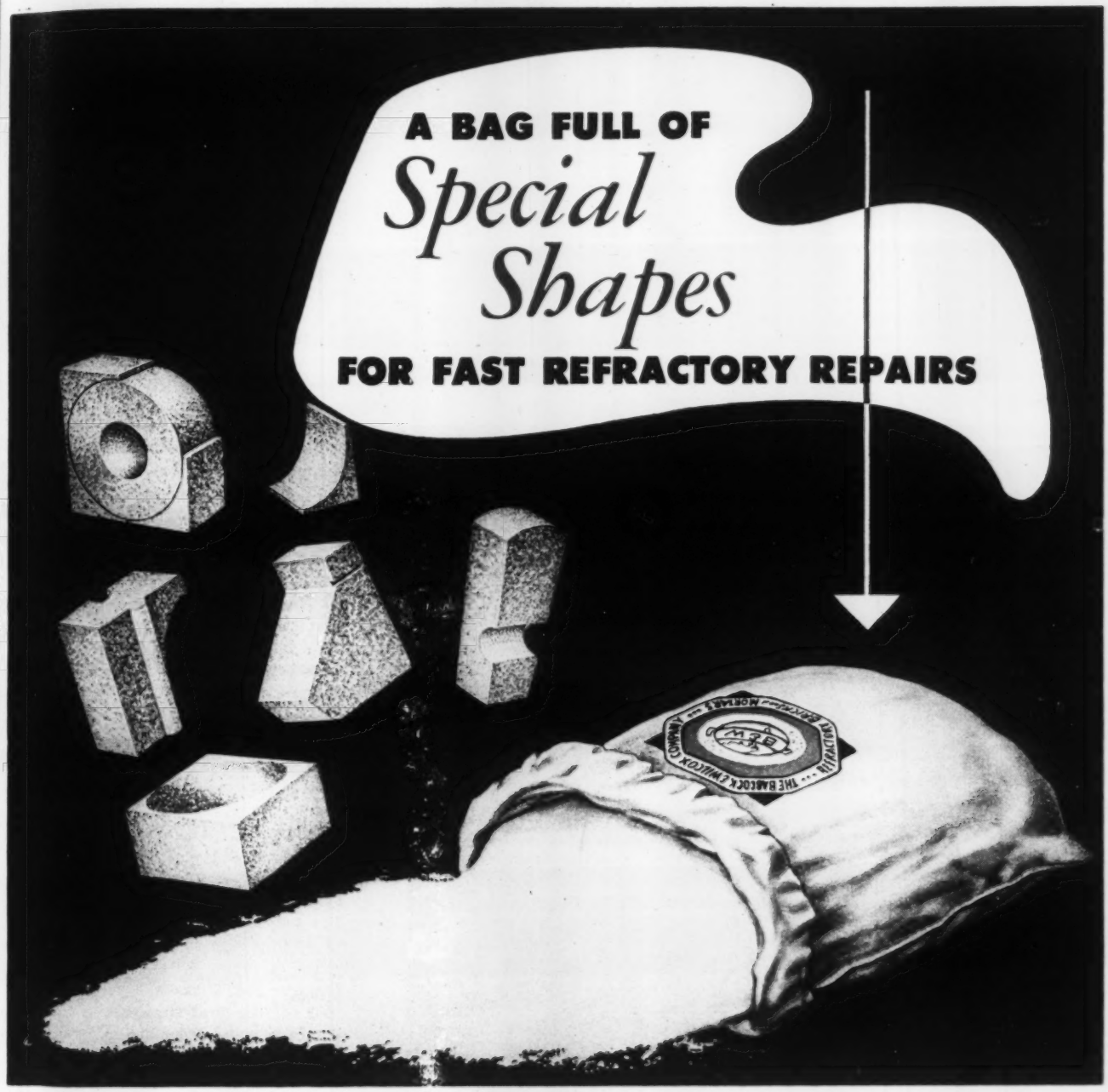
Studs are welded in straight rows to back plate of door to facilitate ramming chrome ore into door

Studded and rammed doors are laid flat to remove excess moisture from chrome ore mix. Venting speeds drying process and eliminates potential steam pockets

COMPARATIVE COSTS OF OPEN-HEARTH DOORS

Heats per day	2¼
Hourly production per furnace	12 tons
Hourly production costs	$60
No. of furnaces	11
No. of doors per furnace	5
Brick door life	15 heats
Brick door cost	$16
Studded and rammed door life	150 heats
Studded and rammed door cost	$125
Direct labor to charge door	$5
Lost furnace time per change	5 minutes

Field Data	——Type of Door—— Studded and Rammed	Brick
1. Average cost of door complete	$125.00	$16.00
2. Average No. heats/door	150	15
3. Heats/door change (Heats/door ÷ 5 doors/furnace)	30	3
4. Cost/door/heat (Line 1 ÷ Line 2)	$0.83	$1.07
5. Total No. heats/year (340 working days x 2¼ heats/day)	765	765
6. Single door cost/year (Line 4 x Line 5)	$635.00	$820.00
7. Total shop cost of door preparation (Line 6 x 11 furnaces x 5 doors/furnace)	$34,925.00	$45,100.00
Door Handling Costs (Approximate)		
8. Estimated labor costs/change	$5.00	$5.00
9. Cost of lost furnace time/change (Operating costs of $60/hour and five minutes/change)	$5.00	$5.00
10. Total of lines 8 & 9 = cost/door change	$10.00	$10.00
11. No. of doors changed/year/furnace (Line 5 ÷ Line 3)	25.5	255
12. Total No. of doors changed = 11 furnaces x Line 11:	286	2805
13. Cost of handling doors/shop (Line 10 x Line 12)	$2,860.00	$28,050.00
Tonnage (Approximate)		
14. Minutes lost/door change	5	5
15. Tonnage lost/change (12 tons/hour, 5 minutes lost)	1	1
16. Total tonnage lost/furnace (Line 15 x Line 11)	26	255
17. Tonnage lost/shop (Line 16 x 11 furnaces)	286	2805
Summary		
Annual direct door cost (Line 7)	$34,925.00	$45,100.00
Annual door handling cost (Line 13)	$2,860.00	$28,050.00
TOTAL	$37,785.00	$73,150.00
Annual tonnage lost	286	2805



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monly used with ram material. The main advantage of this door is that the entire surface is cooled by water.

The studs which support ram material are welded directly to the back plate of the door. A variation of this door is the combination panel door, which includes a series of peepholes for determining the condition of the door insulating material from the outside of the furnace.

The true panel type door, originally designed for use with refractory brick, is also adaptable to the studded and rammed construction. Filler plates may be welded into position between the panels to make the door similar in construction to the combination panel door.

Studs Do Two Jobs—Three factors are of particular importance in preparing a studded and rammed door: Stud size and spacing, proper ramming procedure, and correct curing of the ram material. The end-welded studs used in an open-hearth door serve to provide proper support for the chrome ore ram material, and a heat transmission path from the hot surface of the door to the cooling tank behind in order to keep the insulating material cool.

Selection of the proper stud size and location depends somewhat upon local conditions and individual preferences. However, a few basic principles apply.

Generally speaking, the ½-inch studs are placed on 2½ or 3-inch centers, while ⅝-inch studs are on 3-inch centers, with ¾-inch studs on 3 or 4-inch centers. The studs should be located on the door in straight lines.

When the studs are welded to a door for the first time, chalk lines or a simple wood template can be used. When they are welded on 3 or 4-inch centers, it is advisable to weld additional studs in the center section of the door immediately above the wicket, since this is the area of greatest deterioration.

Heat Transfer Important—Proper transmission of heat from the face of the door to the cooling tank depends almost entirely on the bond between the stud and the back plate. Here, the automatic features of the Nelson stud welding process prove valuable, since each weld joint represents a complete union between the stud and plate. Extensive tests show that a ½-inch end-welded stud is equal in heat transfer qualities to a tackwelded ¾-inch stud.

Many steel producers are using ½-inch studs, since only a single welding generator is required. However, others prefer ⅝-inch studs due to the greater heat transfer resulting from the larger section. Once studs are

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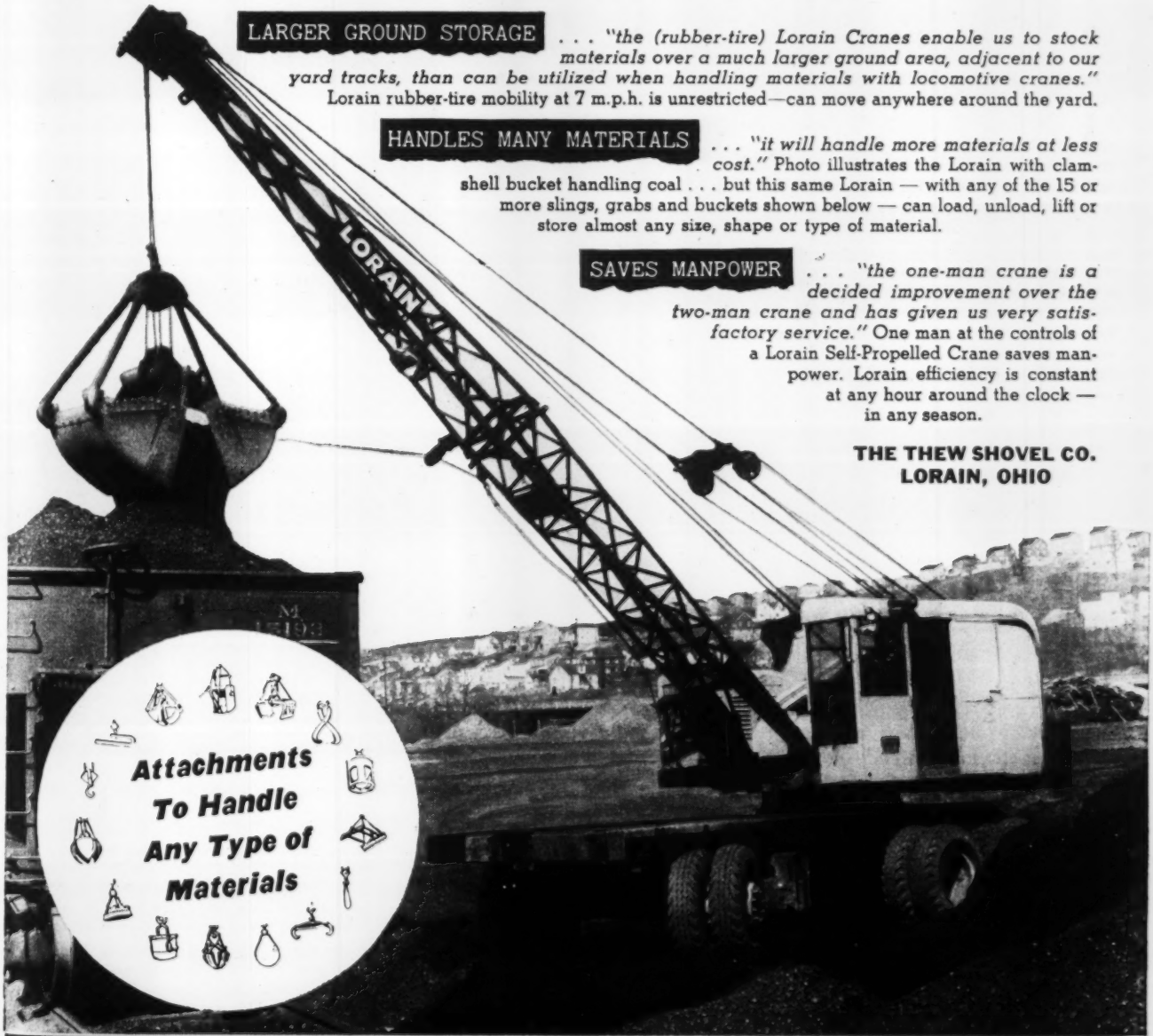

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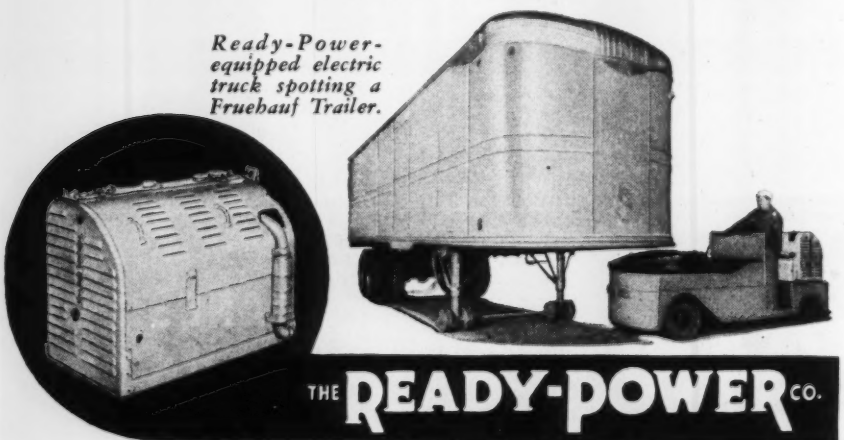

THE READY-POWER CO.

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properly end welded in position, the next step is to ram the chrome ore into the space between the studs. As life of the open-hearth door depends greatly on conditions of the insulating material, it is important to take a few simple precautions in ramming the material into position.

Three Things To Remember—Three major factors should be considered in selecting the ramming method:

1. Material should be rammed so that maximum density is obtained. This will avoid air pockets, hot spots, improve heat transfer qualities, and prevent spalling.
2. Insulating material should be free of laminations parallel to the surface of the door to avoid spalling.
3. Door must be cured properly to drive out most of the moisture and thus avoid formation of steam pockets.

Most common ramming method now used is to place large chunks of the ore in the door and then pack it into position with iron poles or bars. The chunks should be larger than the thickness of the door to avoid laminations. Main disadvantage of this method is that it is difficult to obtain a uniform high density across the entire surface of the door.

A variation of this method is to use a spade-shaped tool to cut up the chunks of ore. The ore is added in two layers, but the action of the spade results in laminations which are at right angles to the surface of the door, not parallel to it. This method is recommended if hand ramming is used. An air gun with a round-nosed or blade-like tool also can be used. The same precautions about building up layers of the ore still apply.

Rough Door Surface Preferred — After ramming is completed, surface of the door should be evened off with a trowel or spade. The rammed ore should not extend past the ends of the studs by more than ⅛-inch, since this portion of the door will spall off immediately.

The door surface should be left rough. If the surface is slick, it should be roughed up with a wire brush. This is important, since floating or slicking the surface draws the binder in the mix to the surface, where it forms an impervious crust, and makes drying operations difficult. Of equal importance is the fact that the material below the surface is deprived of the necessary binder, thus increasing the chances of an early failure.

The doors must be cured before they can be installed, since the ram mixes contain an excessive amount of moisture to assist in working the

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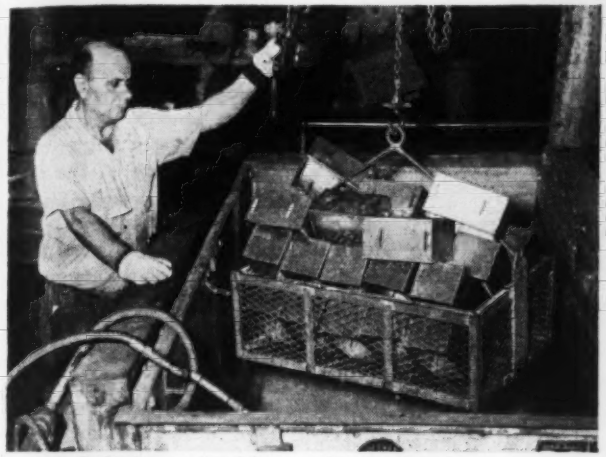

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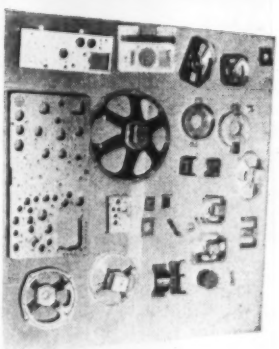

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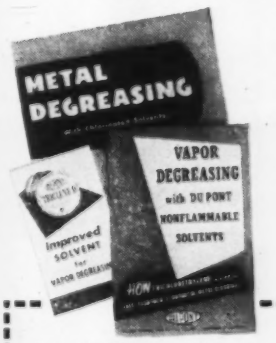

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material. The most common curing method is to circulate steam through the water cooling tank of the door. While being cured, doors should be in a horizontal position, and should remain so until ready for use.

Relining Chores Require Care—After a door is removed from an open-hearth furnace for relining, it is important that it be prepared properly. The first job is to remove the slag and remaining ram material with an air gun or chipping hammer. Then, all of the studs should be removed by a scarfing or rivet cutting torch and the interior surface of the door swept out.

Complete removal of all of the old studs is particularly important to the proper operation of the door. One reason is that the new studs should be end welded to the back plate in the same position as the old ones. This prevents a build up of old ram material, makes packing easy and lengthens door life. Another reason that the new studs should be welded in the same position each time is that perfect welds are obtained, since the burning action of the torch removes all old metal and ram material from the welding area. This is of considerable importance, since one of the major functions of the studs is to carry heat away from the surface of the door to the cooling tank. Unless the stud nubs are removed each time a door is changed, the entire surface of the door will become covered with a layer, consisting of nubbins, chrome ore and slag, which form a barrier that reduces the cooling effect of the water.

The Cost Picture—Determination of total costs of studded and rammed doors involves several factors besides the initial cost of the completed door. Experience shows that in many instances the door cost per heat is lowered with studded and rammed doors.

While the following figures are hypothetical and intended to represent average conditions found throughout the industry, they are based upon actual experiences in several prominent open-hearth shops. These items will vary with local conditions. The following costs are intended only as examples which can be changed to meet conditions found within any one plant.

Three major items must be considered in determining the total cost of keeping open-hearth doors in operating condition during an extended period. Initial door cost is one. Generally speaking, a studded and rammed door will cost five to seven times more than a brick door. However, the average number of heats obtained from a rammed door may be as many as ten times greater than

the number which a brick door can stand.

Door Changing Cost—Direct labor costs are another important item. While job of changing the door itself may not require more than two or three minutes, actual time consumed may be considerably longer if it is necessary to wait for cranes, workmen, etc.

A conservative estimate of the direct labor costs that are involved in changing a door is $5, counting the time of the millwright, craneman, and other operators. In the same manner the heat time lost whenever a door is changed may amount to five minutes or more, depending on local operating conditions and assuming that the furnace is off the line while the door is being changed, in accordance with established safety practices. Assuming a cost of $60 for operating an open hearth (above the cost of raw materials) this lost time amounts to another $5 every time a door is changed.

How Production Is Disturbed—A third factor to consider is the fact that steel production itself is decreased whenever a door is changed. Again, conditions vary from plant to plant, but this lost production is particularly evident in mills where all heat is turned off while a door is changed. Generally speaking, it takes two minutes to build up heat within a furnace for every minute the heat is turned off. Even when only five minutes are required to change a door, 1 ton of steel is lost every time a door is changed when the furnaces are producing at an average rate of 12 tons an hour. Thus it can be seen that production losses can be kept to a minimum by changing the fewest possible number of doors.

To demonstrate the cost savings and the steel production increases possible when studded and rammed doors are used in place of brick doors, the accompanying comparison has been developed as the result of a close cost study made at the Chicago 11-furnace shop. Although these figures are for one particular plant and will vary throughout the country, they are representative of experience in the industry to date.

Thus, it may be seen that cost savings and important production increases are possible when the studded and rammed door is used.

Door Changing Reduced—Even under more unfavorable conditions, when the studded door will only last 100 heats, the total door changes required during a year (in this same plant) would be only 38, as compared to the 255 required for brick doors. In this case, the total mill cost of door preparation will be about

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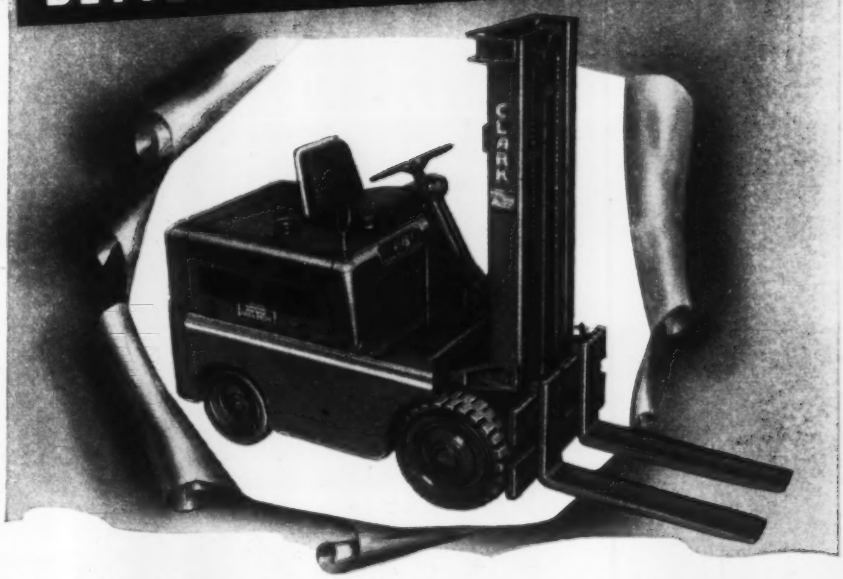

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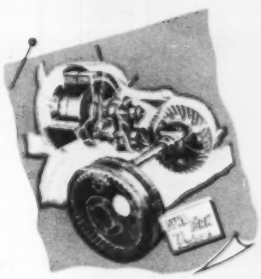

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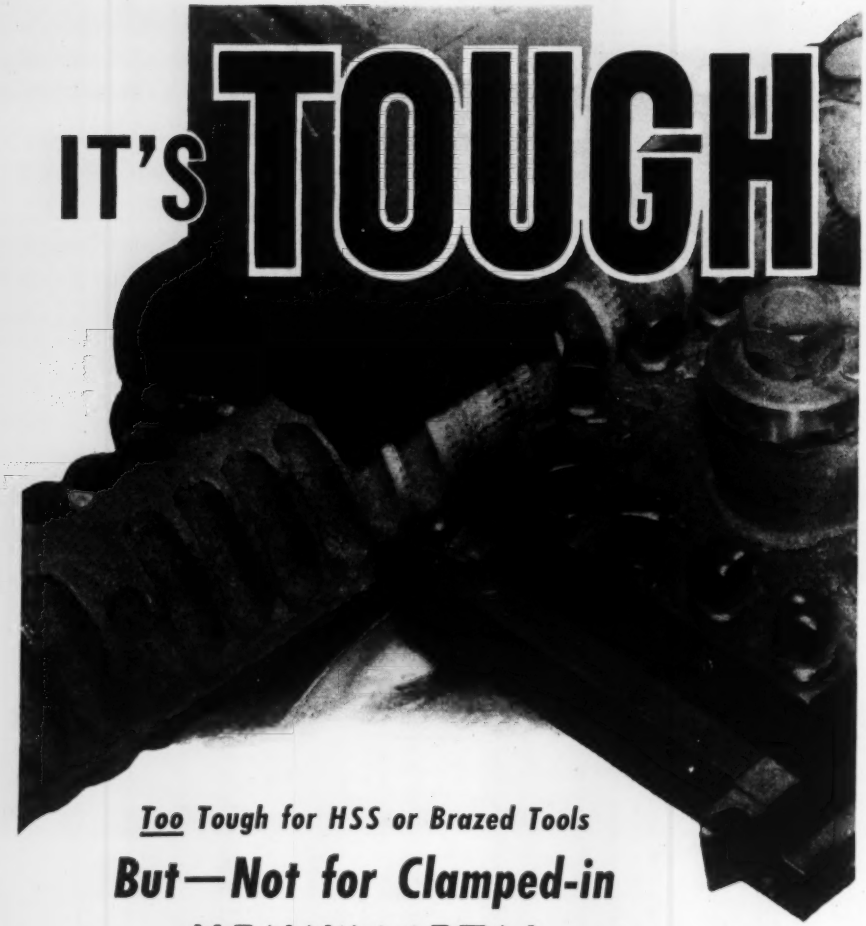

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SFM	39	78.5
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Prod./8 Hrs.	11	16
Pcs./Grind	Avg. 3	Avg. 350
Pcs./Tool	—	5250 (est.)
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$7000 greater for studded doors but the door handling costs will be $26,000 less, resulting in a net saving of some $19,000. Under these conditions, tonnage lost when brick doors are used remains at 2805, but only 418 tons of steel are lost when studded and rammed doors of low-heat life are used.

While it is true that rammed doors using other methods of supporting the mix have proved satisfactory, the advantages inherent in the stud-welding process are sufficient to make this technique worthy of serious consideration. When compared to hand welded studs, end welded studs can be welded in about one third the time, and offer far better heat conductivity, and therefore increased door life.

Railroad Switches to Electricity

Driving rain nor swirling snow will not affect operation of an electrically-lighted railroad lamp, developed by Westinghouse Electric Corp., Pittsburgh, and Primary Battery Division, Thomas A. Edison Inc., East Orange, N. J. The new signal lamp became practical upon the development by Edison of the Carbonaire battery.

Lamp is said to burn with practically equal brightness throughout its life because the soot and dirt common to the oil lamp operation of 500,000 switches at present is absent. Although the lamp is expected to outlast the nonrechargable battery which operates 10 months continuously, for lowest maintenance cost, both will be replaced at the same time. It is possible to retain existing optical systems in the conversion to electricity.

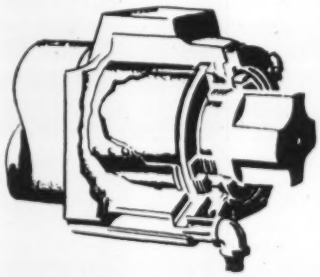
Transformer Manual Published

Need for skilled highly-trained design talent is minimized if you use the report released by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. The manual, PB 100, 478, High Power Pulse Transformer Design & Development, comprises one section of a final report by Armour Research Foundation on a contract with the Navy's Bureau of Ships.

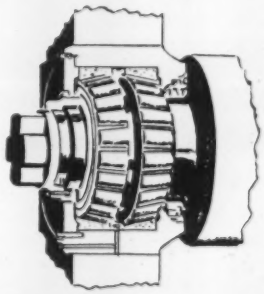
It includes material on high-power pulse transformers used in magnetron circuits and details of a new type of interleaved winding developed by Armour, believed to permit more flexible types of design as well as higher efficiency. The theory of pulse transformers, including operation and materials of construction is dealt with in the first part of the report, which includes diagrams, graphs and tables. It is available

Quick Reference Guide

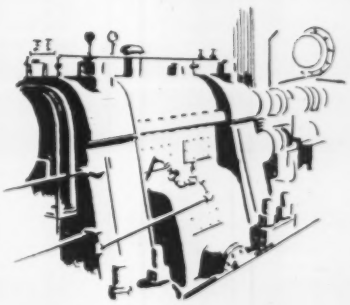
to improved lubrication and lower maintenance costs for rolling mill equipment



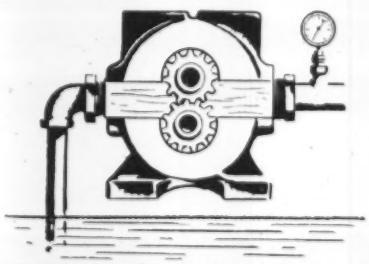
GULF L-C OIL—No. 1 in quality for oil-type back up roll bearings. Proper viscosity range, good water separating characteristics.



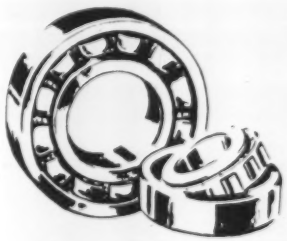
GULF XXX LUBRICANT—The ideal grease for work roll bearings. Extreme pressure type, water resistant, stable!



GULF E. P. LUBRICANTS— better protection for heavily loaded enclosed gears and pinions—good water separating characteristics.



GULF HARMONY OIL—Prevents rust and sludge in hydraulic systems. Good water separating characteristics.



GULF PRECISION GREASE—For better lubrication of ball and roller bearings in steel mill equipment.

GULF LUBRICATION ENGINEERS can help you improve your lubrication practice, reduce your maintenance costs.

It will pay you to investigate their application in your mill... *Call in a Gulf Lubrication Engineer today!*

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Protection

that doesn't cut off light, air or vision

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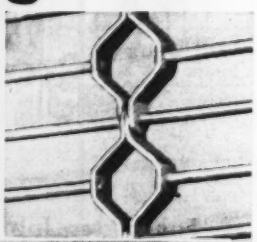
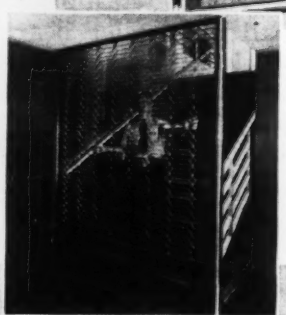
For Windows, Doorways, Corridors



This all-metal barricade guards any opening with a curtain of rugged steel rounds and links. Yet it doesn't cut off light, doesn't block vision, doesn't impede ventilation. It can be lowered into place or raised out of the way in a matter of seconds! It offers convenient protection without loss of architectural beauty. As the pictures here testify, it's the ideal way to prevent trespassing in areas where the public assembles, or wherever it is desirable to block off certain sections of a building.



Kinnear Rolling Grilles open straight upward and coil into a small, out-of-the-way space above the opening. No usable floor or wall space is wasted. In many installations, the mechanism on which the Grilles coil when opened can be concealed within the lintel construction.

Kinnear Rolling Grilles are made to fit any size window, doorway, corridor, stair-well, elevator shaft or other opening. They can be equipped to operate manually, mechanically (by chain or crank) or electrically. Easily installed in old or new buildings. Write for complete details.

The KINNEAR Manufacturing Co.

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Mg Gets "Third Degree"

Extensive tests conducted to determine magnesium's suitability for aircraft use

Because magnesium alloys are light, have a high strength-to-weight ratio, easy machinability and good weldability, they have been seeing increased use in the fabrication of a wide variety of items. While usually resistant to ordinary kinds of atmospheric corrosion, these alloys may corrode seriously in certain industrial atmospheres or along the sea coast, especially if in direct contact with salt water.

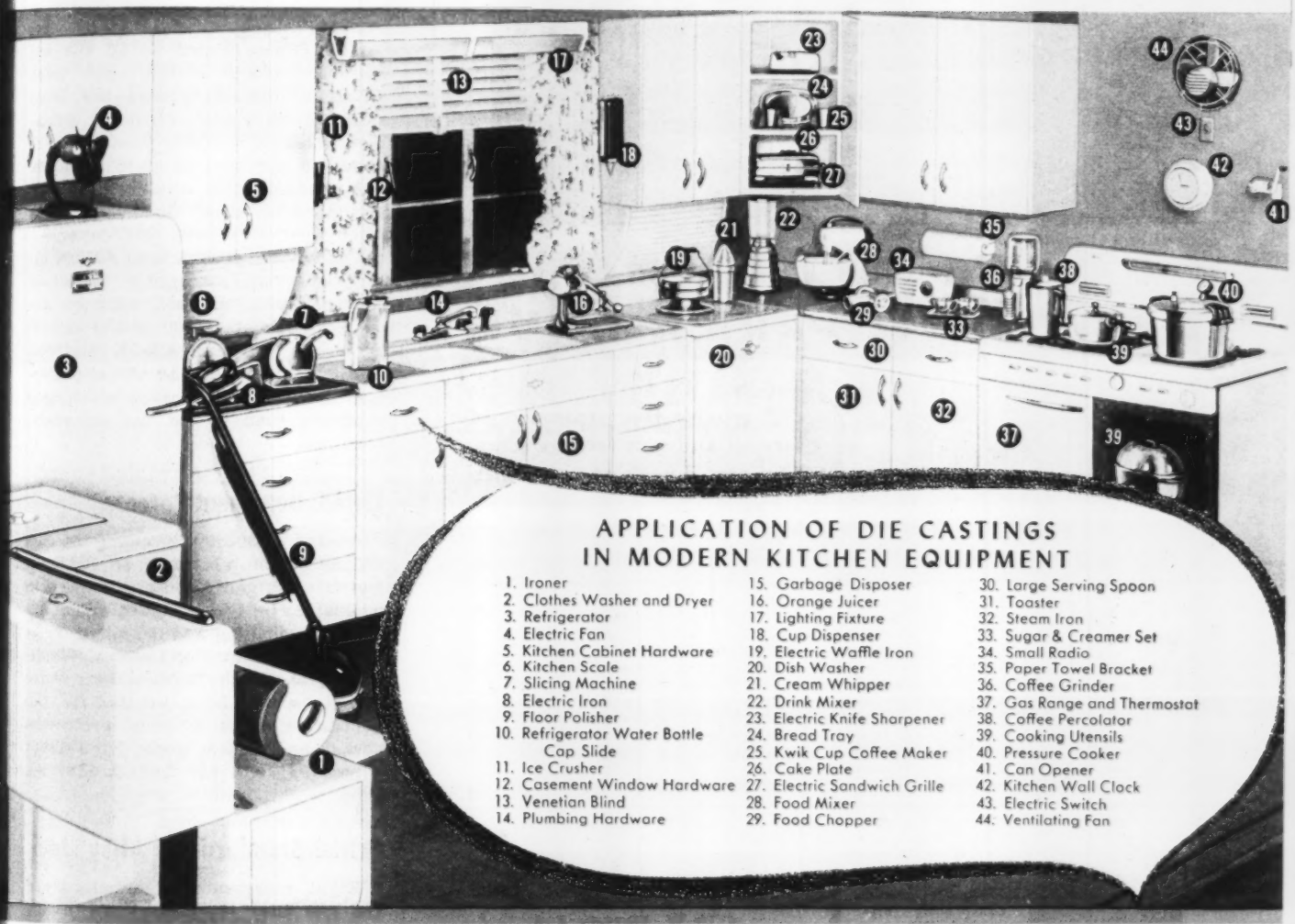
To learn more about their suitability for aircraft use, National Bureau of Standards in co-operation with Bureau of Aeronautics, Department of the Navy, conducted an extensive investigation of the resistance of wrought magnesium alloys to corrosion under stress, both in marine atmosphere and inland atmosphere. Investigation included both sheet and extruded alloys.

Good Dose of Salt — Specimens were exposed to weather stressed in tension at the National Bureau of Standards in Washington and on a platform built over tidewater, so that they were exposed in a marine atmosphere, at Hampton Roads, Va. Unstressed specimens were subjected to the same corrosive conditions in order that the effect of stress in increasing corrosion damage could be evaluated. For intermittent immersion tests, the corroding solution was raised into the testing cells by means of compressed air, wetting the specimens four times per hour. For weather exposure tests, specimens were supported and stressed in a similar fashion but were left exposed to the atmosphere.

In general, susceptibility of magnesium alloys to stress corrosion in the weather increased with aluminum content up to about 6.5 per cent of aluminum. It was found that specimens stressed at the Washingon weather exposure site failed in shorter periods than those exposed to the same stress in a marine atmosphere. On the other hand, damage to unstressed specimens at the Washington site was small as measured by losses in tensile properties. The AZ31X-h material, after being exposed unstressed for 750 days, had a tensile strength of more than 94 per cent of that of the unexposed mate-

44 DIE CAST KITCHEN APPLICATIONS... AND MORE TO COME

Our Die Casting process is the shortest route between raw materials and finished product. We are anxious to assist you in your development work.



APPLICATION OF DIE CASTINGS IN MODERN KITCHEN EQUIPMENT

1. Ironer
2. Clothes Washer and Dryer
3. Refrigerator
4. Electric Fan
5. Kitchen Cabinet Hardware
6. Kitchen Scale
7. Slicing Machine
8. Electric Iron
9. Floor Polisher
10. Refrigerator Water Bottle Cap Slide
11. Ice Crusher
12. Casement Window Hardware
13. Venetian Blind
14. Plumbing Hardware
15. Garbage Disposer
16. Orange Juicer
17. Lighting Fixture
18. Cup Dispenser
19. Electric Waffle Iron
20. Dish Washer
21. Cream Whipper
22. Drink Mixer
23. Electric Knife Sharpener
24. Bread Tray
25. Kwik Cup Coffee Maker
26. Cake Plate
27. Electric Sandwich Grille
28. Food Mixer
29. Food Chopper
30. Large Serving Spoon
31. Toaster
32. Steam Iron
33. Sugar & Creamer Set
34. Small Radio
35. Paper Towel Bracket
36. Coffee Grinder
37. Gas Range and Thermostat
38. Coffee Percolator
39. Cooking Utensils
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41. Can Opener
42. Kitchen Wall Clock
43. Electric Switch
44. Ventilating Fan

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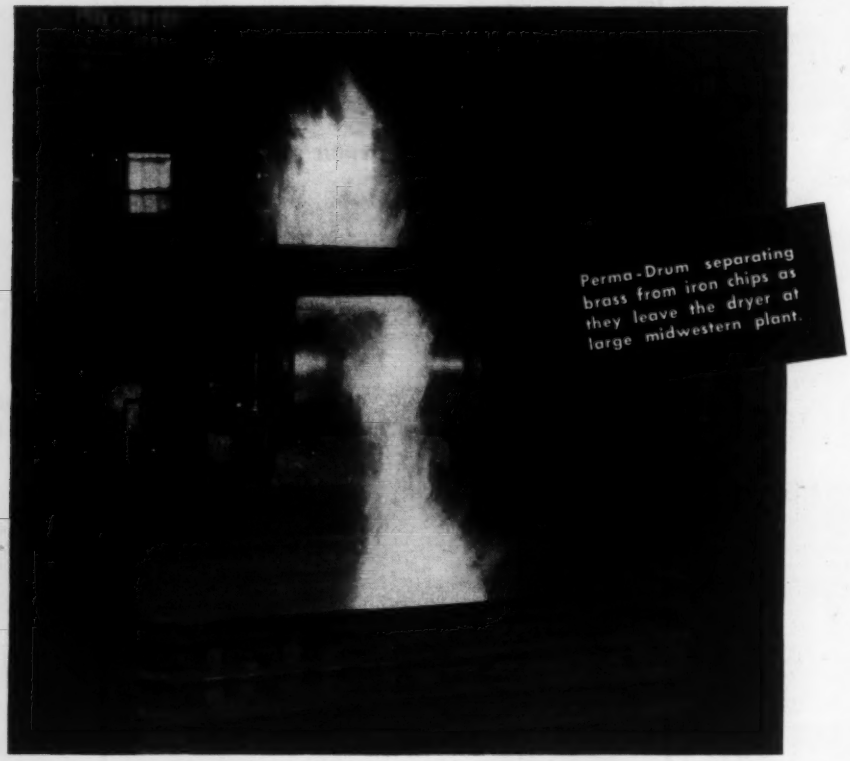
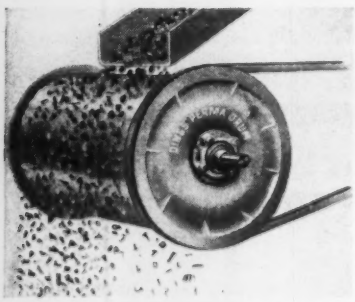
To Cut Your Scrap Separation Costs



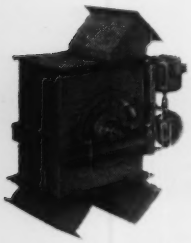
Perma-Drum separating brass from iron chips as they leave the dryer at large midwestern plant.

The New Dings Non-Electric PERMA-DRUM!

Trade Mark Reg. U. S. Pat. Off.



Non-magnetic material flows over revolving drum shell in normal trajectory. Magnetic materials are held fast to shell until carried beyond the magnetic field, at which point they are separately discharged.



Perma-Drums are also available in completely enclosed housings with gear head motor drive.

HERE IS fully automatic trouble-free separation of ferrous and non-ferrous scrap. The new non-electric, self-energized, permanent, Alnico Perma-Drum is more powerful than the old electromagnetic drums. Armor plate drum shell assures long life. Heat or moisture can't hurt the unit. *Magnetic strength is certified* and *magnetic permanence is guaranteed* for the life of the unit. Dollar for dollar you can't beat the new Perma-Drum.

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Dings MAGNETIC SEPARATION HIGH INTENSITY
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rial and its elongation was still more than 85 per cent of the original value.

The Champion—Of all the materials studied, the M1-clad AZ31X-h alloy was the most resistant to stress corrosion. Specimens of this alloy were exposed in a marine atmosphere, stressed to 90 per cent of yield strength, for 500 days without failure.

The M1-h sheet and the ZK-60 extruded material, among the bare alloys, were the best in regard to stress corrosion resistance. After 1175 days of exposure to weather at Washington, under a stress of 16,000 pound-inches^2 or 55 per cent of yield strength, the former sheet alloy had not failed. First failures of the ZK-60 extruded material exposed in the same locality under a stress of 20,000 pound-inches^2 occurred only after 580 days, while specimens stressed to 18,000 pound-inches^2 had not failed in over 1010 days.

How Others Fared — Of the remaining alloys tested, the bare AZ31X-h material proved the most resistant to stress corrosion. Specimens stressed to 16,000 pound-inches^2, about 50 per cent of yield strength, and exposed to the weather at Washington failed after an average exposure period of only 151 days.

The AZ51X, AZ61X, and AZ80X alloys were all susceptible to stress corrosion when exposed outdoors under stresses of 20,000 pound-inches^2 or more. Extruded AZ80X material was more resistant to stress corrosion in the heat-treated and aged condition than in the "as extruded" condition.

Listed: Detergent Patents

Among a special grouping of 206 official patent abstracts on the subject of detergents recently issued in booklet form are 73 for the cleaning of metal, pickling and descaling. Published by Patent Publications, Washington, D. C., the booklet lists those patents which have expired at the conclusion of a 17-year protection period and which were dated from November 19, 1929, through May 30, 1933.

British Standards for Alloy Steel

Eight representative standards of the low alloy steel range are available for routine and research spectrographic analysis from Bureau of Analysed Samples Ltd., 234 Marton Rd., Middlesbrough, England. Standards are available in the form of ½-inch diameter rods and are intended to cover a range of up to 5 per cent of the more usual alloying elements in steel, the iron content of each standard being about 9 1/2

per cent. Steels are also available in the form of fine turnings as standards for photometric methods of analysis.

Want to Reduce Friction?

To reduce friction and wear, the ever-present troublemakers in moving parts, Metal Finishing Division, Pyrene Mfg. Co., Newark, N. J., has developed processes producing a solid film or dry lubricant which is impregnated into surface of metal, plastics, rubber and ceramics. Highly desirable characteristics of graphite are retained, it is said, throughout wide ranges in temperature in a permanent film unaffected by exposure to solvents or weather.

Reports state that the processes have already proved in regular production their value for reducing wear in internal combustion engines and other moving parts such as disk clutches, brakes, gears, worms and splines. Erosion and corrosion may be reduced and inhibited in applications in the electrical and aviation industries.

Known as the Electrofilm graphite processes, a development of Electrofilm Corp. of California, they will be handled by Pyrene's Metal Finishing Division along the Eastern seaboard from Maine to Virginia. They will be available either on job work handled in the company's plant, or if volume warrants, on a licensing basis with Pyrene technical advisory counsel.

Helps Select Correct Battery

Six data sheets which help specification engineers and purchasing agents to select the correct motive power batteries for industrial trucks, mine locomotives and shuttle cars have been made available by Gould Storage Battery Corp., Trenton, N. J. Each sheet includes a cut-away illustration showing battery components in a series of capacity curves from which a battery may be selected according to the power it must deliver and the length of time it must supply this power. Each has a table listing battery sizes for particular model to which the sheet pertains.

Bar Standard Revised

Simplified practice recommendation R26-49, steel reinforcing bars, as revised will consist of a bar number and the weight in pounds per foot for each of the ten sizes of bars. Numbering system is based on the number of eighths of an inch in the nominal diameter of the bars.

Table of typical equivalents is also

Michigan
Electric Resistance
WELDED
STEEL
TUBING

ROUND
3/8" to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR
½" to 2" 20 gauge 1" to 2¾", 14, 16, 18 gauge

Can be Bent,
FLANGED, EXPANDED, TAPERED, DEPRESS BEADED, EXPAND BEADED, ROLLED, EXTERNAL UPSET, INTERNAL UPSET, SPUN CLOSED, FORGED, BEVEL FLANGED, FLATTENED, SWAGED, FLUTED.

Uniform
STRENGTH, WEIGHT, DUCTILITY, MACHINABILITY, WELDABILITY, I.D. and O.D.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Thousands of products today—from the smallest "Gadget" to the largest—earn more profits because of the use of MICHIGAN WELDED STEEL TUBING. The quality and dependability of MICHIGAN TUBING make possible similar profits for manufacturers who have not as yet considered the design and fabrication advantages of welded steel tubing.

A Quality Product,
can be worked in your plant or prefabricated by MICHIGAN.

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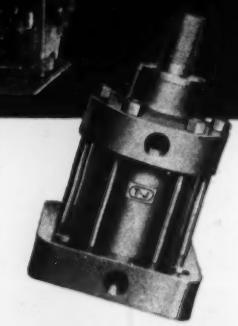
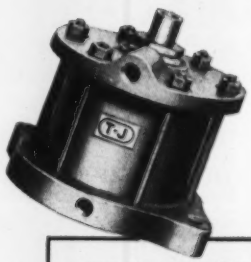
Here's a typical "push-pull" job performed efficiently by T-J Cylinders!

This special nailing machine—equipped with T-J Air Cylinders—is built by Morgan Machine Co., Inc., Rochester, N.Y., for use by Hotpoint in Chicago. The machine is employed to make up skids for mounting electric ranges for shipment. The three boards as shown in the hoppers on top of the machine feed down one at a time while a cross piece from the hopper extended to the right of the machine is fed in. The long T-J Cylinder projecting out in front of the machine feeds the three boards ahead the proper distance and then stops to have a cross piece nailed to them. It then advances automatically to next position until four cross pieces are nailed to the three lateral strips.

For your tough jobs in power movement — pushing, pulling or lifting — *save labor, speed production* and *cut costs* with T-J Air and Hydraulic Cylinders! Many standard sizes and styles . . . both cushioned and non-cushioned types . . . 100 lb. or 50,000 lb. Precision built, versatile, long life. Write for additional information. The Tomkins-Johnson Co., Jackson, Mich.





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33 YEARS EXPERIENCE

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RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

revised and now gives the fractional size formerly used, current bar designations, unit weight per foot, and the nominal dimensions in inches of round sections. Revision is based on recommendations of the Committee on Reinforced Concrete Research, American Iron and Steel Institute. Mimeographed copies of the revision may be obtained from the Commodity Standards Office, Office of Industry and Commerce, Washington 25, D. C.

Grinds Jet Engine Blade Roots

Eighteen months of steady production work has proved to Ex-Cell-O Corp., Detroit, that its two-wheel form grinder for high production processing of jet engine aircraft blades should be made available to others doing the same or similar work. Machine uses two 24-inch diamond-dressed grinding wheels which finish both sides of the root form simultaneously. Automatic functions and simple controls make it possible to use unskilled operators.

Blades are held in fixtures which are removable and may accommodate one or two blades, depending upon size. While one is being ground the finished blade may be removed from another fixture, the fixture reloaded and the finished part checked.

Precision Turning Cuts Costs

By using only one machine instead of two, F. J. Kester Co., Edwardsburg, Mich., has been able to produce aircraft carburetor parts to exacting specifications at a sizable reduction in cost. The carburetor part was a control link made from 24ST4 rectangular aluminum bar stock measuring ½ x 9/16 x 4¾ inches. The center had to be reduced to 5/16-inch diameter, with a surface smoothness not to exceed 100 microinches root mean square or better.

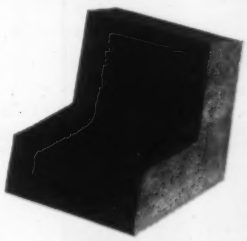
Previous practice dictated machining the part in a lathe, then finishing by grinding to obtain the required surface smoothness. It was an obvious conclusion that a savings could be made if the grinding operation could be eliminated.

The Lathe Takes Over — The job was tooled up on a 9-inch-swing precision bench lathe made by South Bend Lathe Works, South Bend, Ind. Longitudinal feed stops were used to locate both ends of the cut and a cross-feed stop positioned the cutting tool for the diameter. All forming, rough turning and finishing operations were performed by two high speed steel combination forming and turning tools mounted in a square turret tool block.

How to stretch critical tool steels WITH DISSTON® HOT ROLLED SHAPES

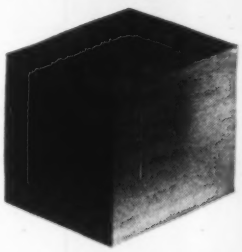
EXAMPLES OF STEEL SAVINGS YOU CAN GET WITH DISSTON HOT ROLLED SHAPES:

This Disston Hot Rolled Shape ▶



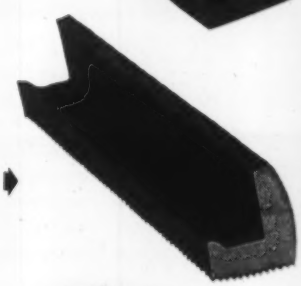
made this knife ▶

saving 51% over this! ▶



This Disston Hot Rolled Shape ▶

made this vise jaw ▶



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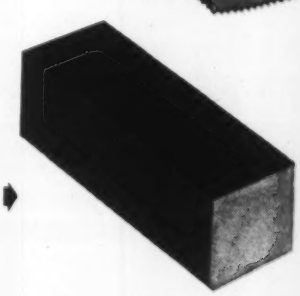

Save up to 50%—and more—on the tool steels you now use. And save not only steel, but machining and manpower also!

Disston Shapes can be rolled in a variety of forms to fit your exact specifications. Tolerances are extremely close, and very fine finishes can be furnished. Disston Hot Rolled Steel Shapes can be made in both alloy and carbon steels, in electric and open hearth grades.

Disston engineers and metallurgists will be glad to work with you in developing the special shapes that will give you the greatest economies. Write us, specifying your needs.

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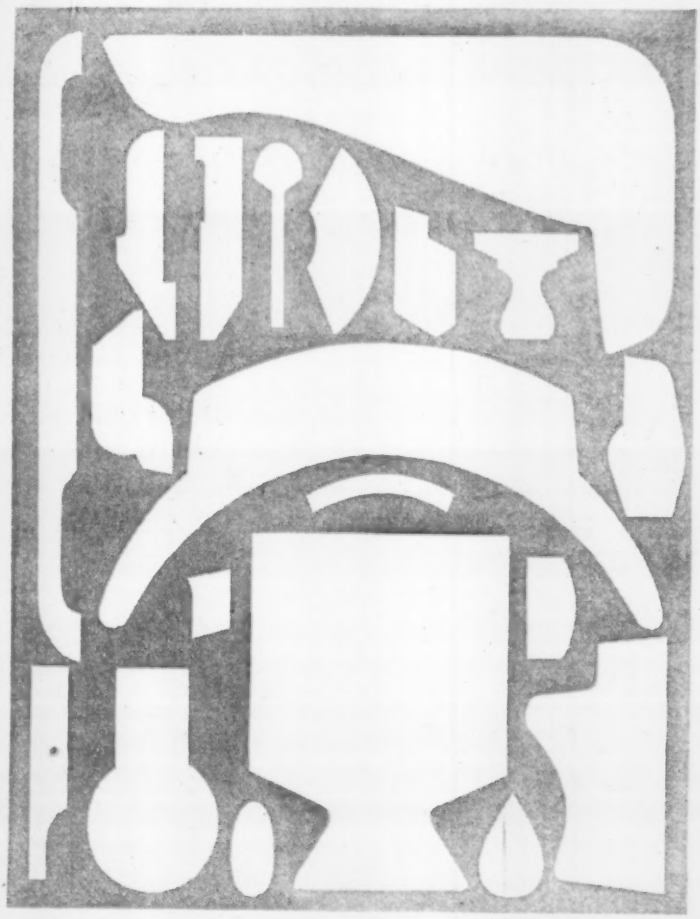
A few of the many forms of DISSTON HOT ROLLED STEEL SHAPES



strip fed from coils

FOLLANSBEE COLD ROLLED STRIP is furnished in continuous coils for direct feeding into automatics. This time-saving method of supplying material to stamping and forming machines is a big step toward increased production.

turns an automatic machine

FOLLANSBEE COLD ROLLED STRIP is widely used in plants manufacturing toasters, tractors and television equipment where high-speed automatic machines turn out parts in astronomical numbers. Continuous feeding from coils is essential to maintaining volume.

into a productioneering team

FOLLANSBEE COLD ROLLED STRIP is furnished to specification—custom-made strip steel in coils suitable for a multitude of productioneering operations. Call the Follansbee Steel Representative nearest you for details on temper, finish, coil sizes, et cetera.

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A 4-jaw independent chuck drives the work piece, being supported in the tailstock by a special revolving center. A single adapter in the chuck permits inserting and removing the work by opening only one chuck jaw, so that recentering is not required.

Mission Accomplished—After some experimentation, the correct spindle speeds and feeds were established and the most satisfactory clearance and rake angles for the cutting tools determined. Where a specified surface smoothness of 100 microinches rms was desired, the average finish of 30 microinches rms is now being maintained on a production basis. One roughing and one finishing cut is taken over the center section of the piece.

Radiographic Testing Comments

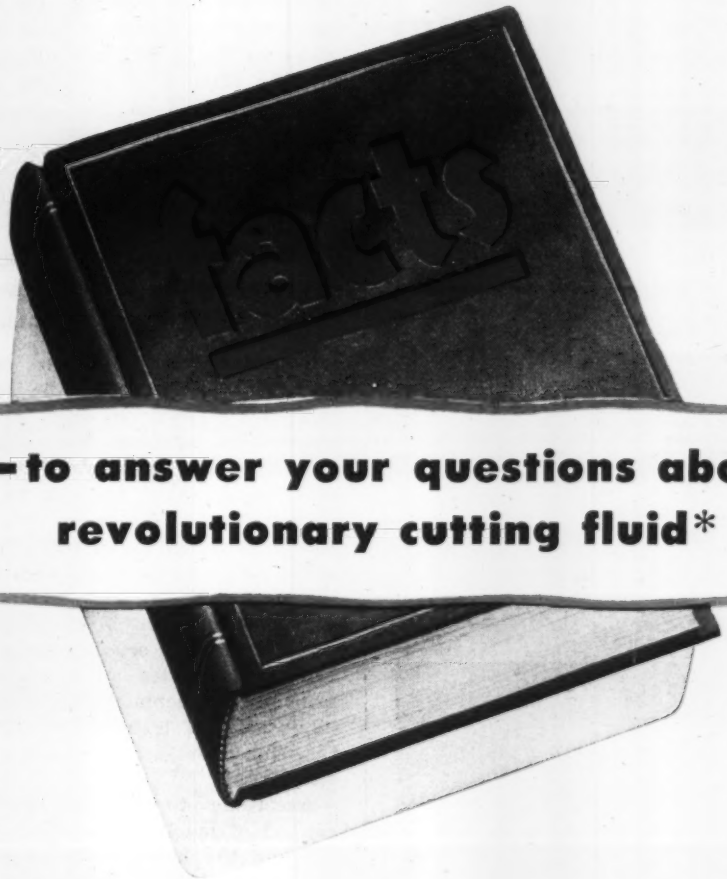
Criticism and comment on a new recommended practice for radiographic testing is being solicited by committee E-7 on nondestructive testing of the American Society for Testing Materials. Proposed recommended practice is an expansion of material formerly included in the now withdrawn methods of radiographic testing E-15.

It was determined at the ASTM annual meeting in June that the new document should be distributed for criticism. Copies now are available from ASTM headquarters, 1916 Race St., Philadelphia 3, Pa., at 50 cents. An effort has been made to include specific instructions for carrying out the various steps of the radiographic process according to the best practice, but without the usual explanatory material which is found in the literature.

Write a Paper for a Prize

Prizes totaling $1000 will be awarded for technical papers having to do with research and development in the field of nonfusion welding. Sponsored by Eutectic Welding Alloys Corp., N. Y., the prize fund has for its purpose the rewarding of scientific and research activity in the branch of welding which, although it has made important progress in the last two years, yet is believed to remain relatively unexplored.

Subject of papers is defined as follows: Technological and research aspects, advances and advantages of use of lower melting (lower than parent) filler metals in the nonfusion welding processes. Application of such processes may be by torch, furnace, induction, carbon arc or metallic arc. Papers may specifically cover: Oxyacetylene, low melting filler;



—to answer your questions about this revolutionary cutting fluid*

Q. Will ANTISEP All-Purpose Base work safely in automatics?

A. *Yes. It has been and is being used in every type of screw machine. The Houghton Man has data on how to clean up machines before installing and how to handle machine lubricant mixes.*

Q. Will ANTISEP A. P. Base gum up, or cause gumming?

A. *Any gumming which might occur is the result of putting this coolant in dirty machines. The new mix should be run for a day or two and then dumped to get rid of "gunk" loosened by the washing action of A. P. Base. Water softener may be needed in some localities.*

Q. Will Antisep A. P. Base live up to its name as regards antiseptic value?

A. *Yes. No dermatitis complaints have been recorded. A powerful germicidal additive prevents growth of "bugs." Operators like the antiseptic ability of A. P. Base.*

Q. Should Antisep A. P. Base be used for grinding?

A. *Not usually recommended for grinding, as film strength additives tend to load up the wheel. Here we advise ANTISEP SOLUBLE GRINDING OIL.*

Q. Can this Base be used as a drawing lubricant also?

A. *Yes. It may be mixed with equal parts of oil or water and used for stamping or punching.*

Q. Will Antisep A. P. Base clean readily from the work?

A. *Yes, in any mild alkaline cleaning bath, emulsion cleaner tank or standard degreaser.*

Q. Will Antisep All-Purpose Base save me money?

A. *Yes—mixed with water, it costs between 6 and 8 cents per gallon, depending upon the dilution. Compare that with your 22 to 45 cent straight oils!*

For answers to any further questions, prices and application data, write E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pa.

* HOUGHTON'S
ANTISEP
All-Purpose
CUTTING BASE

how Aircomatic® and Heliwelding teamed to fabricate a tough aluminum job

GRIFFIN & COMPANY, Louisville, Ky., received a contract to fabricate a number of all-aluminum evaporative cooler assemblies recently. Part of the assembly consisted of a tank 6½′ long, 5′ wide and 2′ high, constructed of 3/16″ aluminum sheets. Air Reduction was consulted to determine the most expedient welding process.

J. X. Merkt and C. G. Davis, Airco Technical Sales Representatives, recommended that both Aircomatic welding and Heliwelding be used. The high speed and the ability to make welds without interruption resulted in an economy that clearly favored Aircomatic for the tank welding. Heliwelding was used in the fittings because Aircomatic's extreme high speed would have made this application quite difficult.

In all, there were 279″ of weld per tank and the approximate welding time, including fit-up and tacking, was but one hour. *Warpage and distortion were completely eliminated and, thus far, 120 of these assemblies have been completed without a single leak.* The amount of aluminum used on this job totalled 125 tons.

If you have a particular fabrication problem involving aluminum, stainless or the bronzes, investigate the advantages of Aircomatic and Heliwelding. For technical service or for descriptive literature on these two processes, please write your nearest Airco office for copies of ADC-709 and ADC-661.

AIRCO **AIR REDUCTION**

Offices in Principal Cities

TECHNICAL SALES SERVICE—ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

oxyfuel gas, low melting filler; brazing and bronze welding; hard facing and resurfacing with low melting filler. The $500, $300 and $200 prizes will be offered in the competition which closes May 31, 1951.

Irregular Shaped Carbide

Made into accurate shapes by process which can make similar parts to close measurements

Tungsten and titanium carbide parts, made of one of the hardest materials known to man, may be made into intricate and irregular shapes by a process which holds dimensions on most parts to as close as 0.002-inch. Where it previously has been necessary to resort to sintering in order to make such parts, the Method X Co., Philadelphia, uses a process consisting of two controlled procedures: An original-design machine which uses an entirely new principle in machining; application of highly skilled technicians operating the machine from predetermined standards.

According to the company, the method of machine control, the tooling and the high frequency electric power variables are used in a manner believed to be original. Internal and external holes and shapes can be held to dimension as close as 0.002-inch on most parts. Irrespective of quantity of the parts, each will be identical as to tolerance, it is reported.

Not Even Skin Deep — Operations have no effect upon the quality or structure of the tungsten carbide material, the only visible evidence of a company's processing being a slight discoloration of the surface which is subsequently removed in normal grinding or lapping operation. It has been found that the process is equally successful on tough carbide and the harder grades.

It is emphasized that the Method X process can be used as an intermediate step in the finishing of a part which has previously been sintered. Most of the oversize can be removed, thus reducing the grinding to a minimum. The company also states that it can produce similar results on hardened steel and cast alloy materials without affecting hardness.

Manual on Technical Cements

A practical handbook on the application of adhesive cements and compounds is the new engineers' production manual just issued by Sauereisen Cements Co., Pittsburgh. It contains 64 pages, with over 150 illustrations, data and charts.

Products and Personnel

(*Continued from Page* 132)

Booth No.

Mir-O-Col Alloy Co., Inc. 1514
Los Angeles

To Exhibit—Tungsten carbide electrode for use with AC or DC machines, special alloy castings with an analysis designed for toughness and hardness

Representatives—L. L. Pellegrin, president; C. W. Kirk, vice president

Morganite Inc. 2737
Long Island City, N. Y.

To Exhibit—High temperature tubes and crucibles stabilized for service up to 3092° F and 3600° F, respectively

Morton Gregory Corp. 2559
Lorain, O.

See Nelson Stud Welding Division

National Bearing Div. American Brake Shoe Co. 2024
St. Louis

National Carbon Div., Union Carbide & Carbon Corp. 901
New York

National Cored Forgings Co. Inc. 2123
South Norwalk, Conn.

To Exhibit—Brass, bronze and copper cored forgings

National Diamond Laboratory . 2447
New York

To Exhibit—Resinoid bond diamond hone for finish honing, lapping and breaking feather edge of cemented carbide tools; type T production cluster tool with T-shaped diamond dresser to be used as production dressing tool or hand dresser; type S cluster tool with diamonds set in a dome-shaped "soft bond" tungsten carbide matrix; machines to set an industrial diamond in user's plant

National Lead Co. 1917
New York

National Radiator Co. 414
Johnstown, Pa.

National Research Corp. 1816
Cambridge, Mass.

National Spectrographic Laboratories 129
Cleveland

Navy Department 2903
Washington, D. C.

Nelson Stud Welding Division, Morton Gregory Corp. 2559
Lorain, O.

To Exhibit—Motor operated generator set and battery-operated unit developed for operation of Nelson stud welding equipment; demonstrations of the use of Nelson stud welding gun

Representatives—R. C. Singleton, manager, equipment and industrial sales; R. C. Friedly, midwestern regional manager; G. J. Kauss and W. G. Tawse, field engineers

NEW EQUIPMENT DIGEST . 1925
Cleveland

Representatives—A. N. Gregg, editor; F. O. Rice, publisher; J. H. Robison, Cleveland, W. J. Lowitz and J. M. Wells, Chicago, business staff; M. E. Olson, sales promotion manager

New Jersey Zinc Co. 2103
New York

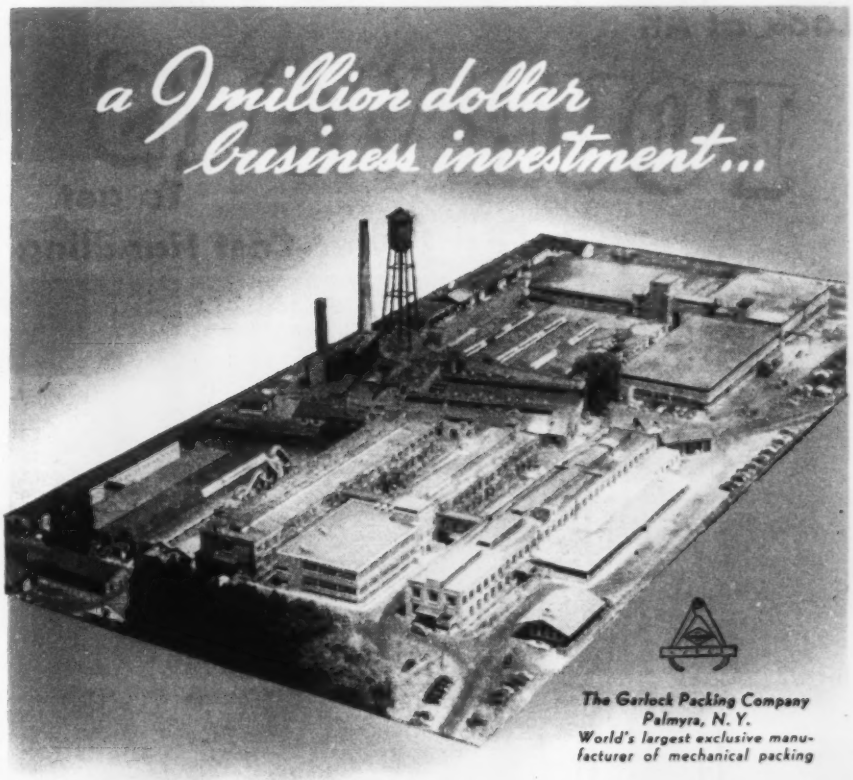
To Exhibit—Variety of zinc die castings display of ordnance die castings showing industry in war production; panel showing variety of organic and electroplated finishes which can be applied on zinc die castings

Representatives—R. G. Kenly, assistant sales manager; E. H. Klein, manager, Metal Division; R. Davison, manager, Market Development Division; C. R. Maxon and R. E. Kellers, Market Development Division; D. C. Bradley, New York metal sales; D. P. Brannin, manager, Chicago office; J. S. Collbran Jr., assistant manager, chicago office; R. F. Burns, E. K. Vaughn and R. A. Jacobson, Chicago metal sales

North American Phillips Co. .. 528
Mt. Vernon, N. Y.

Nox-Rust Chemical Corp. 2643
Chicago

To Exhibit—Nox-Rust vapor wrapper, rust preventive paper, rust preventive coatings



The Garlock Packing Company
Palmyra, N. Y.
World's largest exclusive manufacturer of mechanical packing

...*"Automatic" Sprinkler* protected, of course!

It's not surprising that many leading manufacturers, like The Garlock Packing Company, for example, have found that fire protection by *"Automatic" Sprinkler* earns dividends in dollars as well as in safety. The first buildings of this multi-structure facility were sprinklered back in 1923 and the initial cost of installation has long since been amortized. Subsequent new construction has also come under the vigilance of *"Automatic" Sprinkler* protection, *an investment in safety that can't be beat.*

Like Garlock, your business too, is in a position to realize the money saving advantages of fire protection by *"Automatic" Sprinkler*, and you'll find the following facts worth keeping in mind:

1. Over a half century of background in the design, manufacture, engineering, installation and maintenance of all types of sprinkler equipments, qualifies *"Automatic" Sprinkler's* leadership in the science of fire protection.
2. *"Automatic" Sprinkler* devices and systems are designed to the individual requirements of business, commercial and industrial alike, and are approved by all leading insurance authorities.
3. *"Talking over"* the safety and investment advantages of *"Automatic" Sprinkler* involves no obligation on your part and surveys and estimates are cheerfully furnished without cost or obligation.

TYPICAL
"Automatic" Sprinkler
PROTECTED PROPERTIES

Industrial Plants
Storage - Warehousing
Mercantiles
Piers - Wharves
Aviation Properties
Hospitals - Institutions
Hotels - Apartments
Schools - Colleges
Offices - Public Buildings

"Automatic" FIRE-FOG
provides positive protection for severe fire hazards

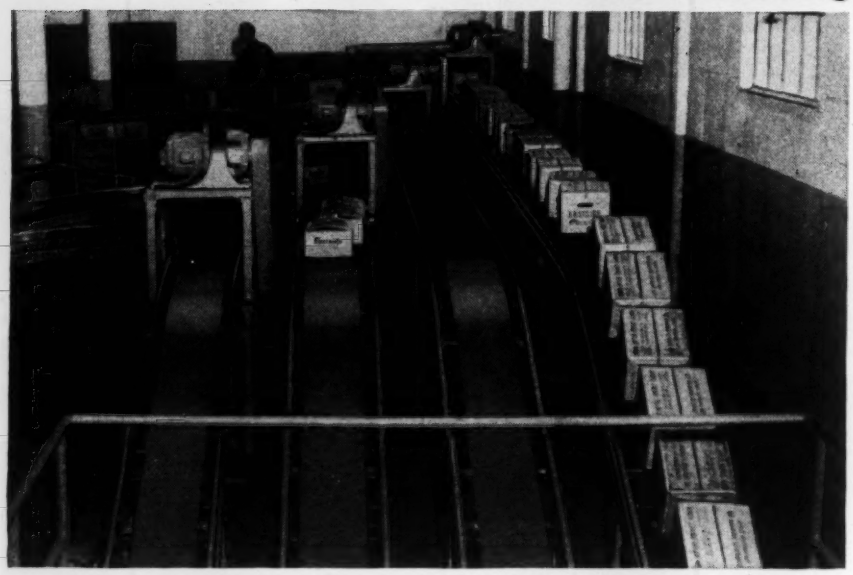
"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FOR INVESTMENT PROTECTION
DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

Look at All

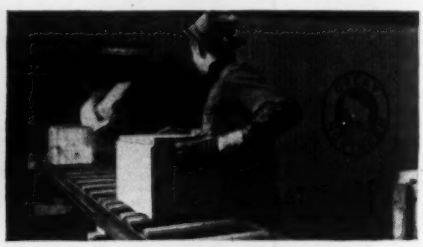
FOUR WAYS To get

Fast Lower-Cost Handling



1 WITH ROLLER OR BELT CONVEYORS

— Order and cleanliness — freedom from congestion — smooth flowing coordinated movement of commodities — these are the plus advantages of roller or belt conveyors, gravity or power, in addition to their time, money, and manpower economies.



2 with the EXTENDOVEYOR

— compact, mobile, easily maneuverable power-belt conveyor unit—handles packages up to 150 lbs.—reaches into cars, trucks, trailers. Available in 4 sizes — 2 models.

3 with PORTABLE ROLLER CONVEYOR

— light, easy to carry and set up where needed. Standard Litewate Sectional Roller Conveyor is a great time and labor saver in loading, unloading, storing commodities. Available in 5 ft. and 10 ft. sections — straight and 90° or 45° curves.

4 with PNEUMATIC TUBE SYSTEMS

— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog No. ST-100. Tell us what you want to handle or name equipment on which you want more information.

STANDARD CONVEYOR COMPANY
North St. Paul 9, Minn.
Sales and Service in Principal Cities

Booth No.

Representatives—F. L. Way, sales manager; C. E. Salzman, Chicago district manager; D. K. Blankenship, Southern district manager; W. W. Henderson, technical field representative

Oakite Products Inc. 322
New York

To Exhibit—Oakite Compound No. 33 prepaint cleaner for removing rust and oil and preparing metal for painting; CrysCoat process for prepaint cleaning of metal parts by automatic washing machine; materials for electro-cleaning steel, brass and copper, pickling, deoxidizing and bright dipping, barrel cleaning, burnishing, machining and grinding, rust prevention

Representatives—Frank J. McNally, Chicago Division manager; representatives from field service organization and headquarters offices

Ohio Crankshaft Co. 910
Cleveland

Ohio Seamless Tube Co. 109
Shelby, Ohio

To Exhibit—Seamless and electric resistant welded steel tubing fabricated and forging samples

Representatives—M. W. Freese, advertising manager; J. J. Arntz, market development manager; G. Zebold, sales promotion; A. Waines, vice president and manager of sales; H. R. Lewis, chief metallurgist; R. Laird, assistant chief metallurgist; H. Nicholson, metallurgist; L. Ritchey, manager quality control; J. Clabaugh, quality control; W. R. Wood, district sales manager; J. O. Hess, Chicago sales representative

Olin Industries Inc. 2502
East Alton, Ill.
See Western Cartridge Co.

Tinius Olsen Testing Machine Co. 629
Willow Grove, Pa.

O'Neil-Irwin Mfg. Co. 1603
Lake City, Minn.

Optimus Equipment Co. 1732
Matawan, N. J.

To Exhibit—Model OP2 vapor spray degreaser, vapor degreasers, metal parts washers and dryers

Representatives—Melville Morris, president; Charles L. Green, Detroit office; J. J. Prendergast, Indiana office; Clair G. Brunn, Chicago office

Osborn Mfg. Co. 319
Cleveland

To Exhibit—New gear deburring method using semiautomatic universal workpiece holder and brushing lathe, Heli-Master brushes for scrubbing sheet steel

Representatives—A. B. Parnall, vice president, sales and manufacturing, Brush Division; F. T. Turner, manager, industrial sales; G. R. Lundberg, assistant sales manager; R. O. Peterson, manager, technical dept.; R. R. Schultz, advertising manager; V. K. Charvat, assistant manager, technical dept.; R. C. Sasena, R. A. Barta, A. J. Chandler, R. G. Smellie, R. Lincoln, E. Richards, engineers, technical dept.; J. R. Broughan, sales dept.; S. C. Foxall, W. C. LaBerge, L. H. Ross, sales representatives

Ozalid Div., General Aniline & Film Corp. 1527
Johnson City, N. Y.

To Exhibit—Printmaster, Super B, Streamliner printmaking equipment

Representatives—Hugh Silbaugh, manager, sales promotion; Lowell Freshley, both of Johnson City, N. Y.; Conde Hamlin, Chicago branch sales manager; L. R. Fuller, Mid-Western regional sales manager

Pangborn Corp. 2560
Hagerstown, Md.

To Exhibit—Liquid blast machine for surface finishing and maintenance cleaning of dies, molds and other metallic surfaces; portable blast machine using finely ground corn cobs as abrasive for cleaning, degreasing and reconditioning; Hydro-Finish (wet blast) machine with accessory track and work loading car; portable soft abrasive blast cleaning machine, miscellaneous work pieces

Representatives—Victor F. Stine, vice president; B. H. Marks, manager, Hydro-Finish Division; Leonard W. Wagner, Chicago district manager; Frank Newell and R. W. Gossard, Chicago sales engineers and A. Lesley Gardner, advertising manager

WILL SANDVIK SPRING STEEL'S UNIFORM HARDNESS improve YOUR product?

The uniform hardness provided by Sandvik spring steels may make an important difference in your product. It can minimize die wear, improve blanking properties and assure better performance of the steel part itself.

Whenever your spring steel application calls for uniform hardness, high fatigue life, close tolerances or fine surface finish, think of Sandvik.

Sandvik cold-rolled strip steels are available:

- **Precision rolled in thicknesses from .001"**
- **In straight carbon and alloy grades**
- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- **In a wide range of widths**
- **Unpolished or polished bright, yellow or blue**
- **With square, rolled or treated edges**

Phone, write or wire your nearest Sandvik office for further information or technical help.

SANDVIK STEEL, Inc., 111 Eighth Ave., N. Y. 11, WAtkins 9-7180
230 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-5638
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 1-2303
SANDVIK CANADIAN LTD., 426 McGill St., Mont., Can.

FREE SANDVIK CATALOG
DESCRIBES 785 SPRING STEEL SIZES

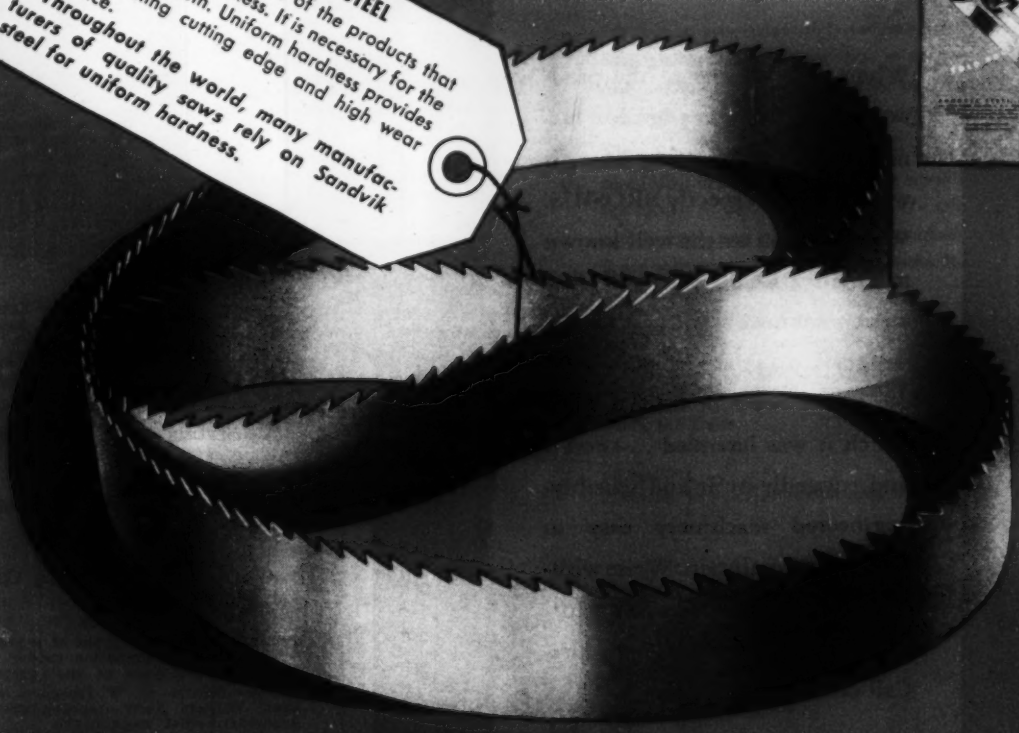
Write, on your letterhead, for your copy, today.

SS-63

MADE OF SANDVIK STEEL

A high quality saw is one of the products that require uniform hardness. It is necessary for the setting of the teeth. Uniform hardness provides a keen, lasting cutting edge and high wear resistance.

Throughout the world, many manufacturers of quality saws rely on Sandvik steel for uniform hardness.

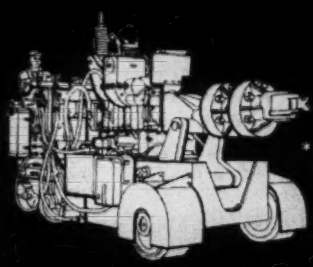


SOME SANDVIK SPECIALTY STRIP STEELS—Steel for Textile Machine Parts • Band Saw Steels; Metal Band, Wood Band and Butcher Band • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel Knife Steels • Razor Blade Steel • Reed Steels • Shock Absorber Steel • Sinker Steel Spring Steels • Trowel Steel • Vibrator Reed Steel, etc.

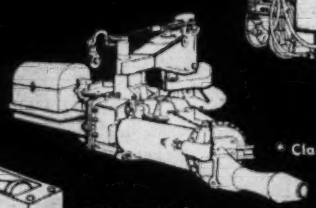
specify

BROSIUS*

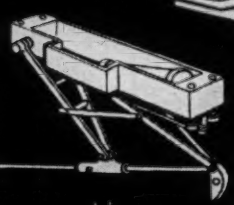
for the keenest product-engineering



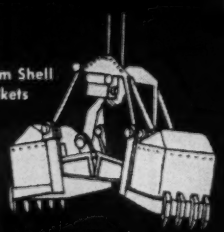
* Chargers and Manipulators



* Clay Guns

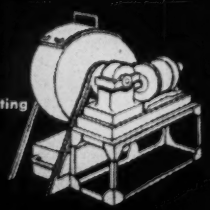


* Cinder Notch Stoppers



* Clam Shell Buckets

* Slag Granulating Mills



Coke Testing Barrels

Goggle Valves

* When you buy any of the products shown on this page for furnace or mill or forging floor, it will pay you to specify BROSIUS. Wherever you see the well-known mark of BROSIUS, you'll find equipment keenly and specifically designed to do the best job according to the needs of the plant for which it was intended . . . you'll find ruggedly-built and sensibly-engineered machinery easy to operate and maintain. Write without obligation for detailed information on any BROSIUS product. Call on us today.

Edgar E. BROSIUS Company Inc.

SHARPSBURG • PITTSBURGH 15 • PA.

	Booth No.
Park Chemical Co.	1202
Detroit	
Parker-Kalon Corp.	2418
New York	
Partlow Corp.	818
New Hartford, N. Y.	

To Exhibit—Model E thermostatically operated proportional heat input control; model RTCS type, time-temperature program control; Saf-T-Flame safety gas pilot; Uniflame gas burner

Representatives—Howard W. Partlow Jr., president; Thomas P. Owens, secretary; Albert W. Orton, factory superintendent; James K. Clark, Charles W. Pflieger, Joseph Codichini, development engineers; Wayne A. McGrew, export manager; plus the following field representatives: Alvin M. Stock and N. E. Bertl, New York; Oliver Stirling Jr., Detroit; Hubert Glatte and Robert Glatte, Cleveland; B. L. Finn and James Conway, Chicago

C. F. Pease Co.	2228
Chicago	

To Exhibit—Pacemaker automatic white-printing machine

Representatives—W. Earle Pashley, president; Arthur F. Jacobs, vice president; D. L. Cornwell, chief engineer; H. D. Lind, manager, machinery sales; Fred Lippert, sales engineer; John Taini, chief draftsman; John Stranberg, service manager; John C. Bell and Leonard E. Birch, Chicago district representatives; R. L. Fenstermacher and K. R. Curtis, factory sales representatives

Penton Publishing Co.	1925
Cleveland	

Publishers of STEEL, THE FOUNDRY, MACHINE DESIGN and NEW EQUIPMENT DIGEST
(see individual listings under these publication names)

Representatives—E. L. Shaner, chairman; G. O. Hays, president and treasurer; R. C. Jaenke, vice president and director of advertising

Phillips Mfg. Co.	2031
Chicago	
Physicists Research Co.	2566
Ann Arbor, Mich.	

To Exhibit—Line of Profilometer equipment for shop measurement of surface roughness on parts of all shapes and sizes

Representatives—Ernest J. Abbott, manager; Frank W. Kabat, head field representatives department; Arnold Loyd, George Haber Jr., field representatives; William R. Frakes, development engineer

Pines Engineering Co. Inc.	2410
Aurora, Ill.	

To Exhibit—Series 1600 rotary fixture bender, series 1400 semiautomatic bender, size ¾ bender, series 600 and 700 end finishing machines

Representatives—B. F. Bower, president; J. E. Hawking, sales manager; E. C. Fitzpatrick and G. F. Behrend, sales engineers

Plastic Metals Div., National Radiator Co.	414
Johnstown, Pa.	
Platecoil Div., Kold-Hold Mfg. Co.	2208
Lansing, Mich.	
Powdered Metal Products Corp. of America	2642
Franklin Park, Ill.	

To Exhibit—Various types of gears, such as bevel, helical, combination ratchet and spur gears, various types of spur gears

Representatives—M. W. Isaacson, sales manager; William Kelly, representative; P. V. Schneider, chief metallurgist

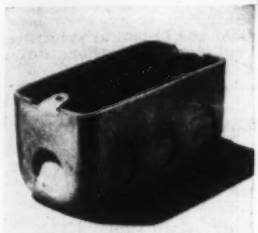
Power Tool Div., Rockwell Mfg. Co.	2701
Milwaukee	

See Rockwell Mfg. Co.

Precision Extrusions	2424
Bensenville, Ill.	
Precision Shapes Inc.	2524
Suffern, N. Y.	
Precision Welder & Machine Co.	429
Cincinnati	

DRAWING

FLOAT



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Deep Drawing, Stamping, Embossing

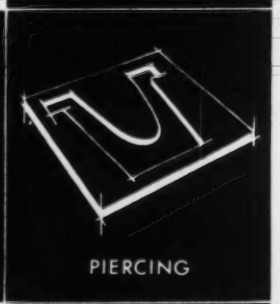
Unless you have a SEIDELHUBER quotation,

You won't have the BEST PRICE!

SAFETY HAT

STAMPING

EMBOSSING



PIERCING

FEEDING PAN

FORMING

1. Over a half-million dollars in specialized stamping and deep drawing equipment at your service! Not a cent invested by you!
2. A nationally reputed organization of thoroughly trained, long experienced engineers . . . production planners . . . tool designers . . . skilled machine operators—and not a penny added to *your* payroll!
3. Accurate and notably low estimates . . . firm quotations . . . specific per-piece costs for you.
4. Production schedules and delivery problems solved through complete cooperation in planning, designing and delivery timing. As reliable and efficient as if the entire operation were in your own plant!
5. *Most advanced methods of cutting costs for you*—We also specialize in low cost dies where small quantities do not justify or permit costly dies. We use lead, rubber and Kirksite and are thoroughly experienced in using these materials for short-run production requirements.

METALWORKING (All Kinds of Metals)
Blanking, Forming, Punching, Drawing, Embossing, Stamping, Shearing

SUB-ASSEMBLY, FABRICATION
Stampings Assembly, Welding—Arc, Gas, Seam and Spot, Etc.

TOOL MAKING
Dies, Jigs, Fixtures

FINISHING
Cleaning, Tumbling, Heat Treating, Plating and Enameling

SINCE 1906
Engineers and Manufacturers of Fine
Quality Metal Products for Industry and Home

Guaranteed Finest Quality

SEIDELHUBER IRON & BRONZE WORKS, INC.

3693 DUWAMISH AVENUE • SEATTLE 4, WASHINGTON

SHORTEST DISTANCE BETWEEN RAW MATERIAL AND FINISHED PRODUCT

Nickeloid *Pre-finished* Metals eliminate many costly operations — cleaning, plating, polishing — and in addition provide lustrous new beauty. You simply *fabricate*, then *assemble!* And those *two steps* take you to lower production costs, *plus* greater product beauty.

Nickeloid Pre-finished Metals are available in sheets or coils, in wide range of gauges, and tempers, plated one or two sides, bright or satin finishes of Chromium, Nickel, Brass or Copper, plated to base metals such as Steel, Zinc, Brass, Copper or Aluminum.

Write for new "Flow-Chart" showing how Nickeloid Pre-finished Metals eliminate costly production operations.

NICKELOID METALS (Pre-Plated)
NICKEL · CHROMIUM · BRASS · COPPER
Electro-plated TO ALL COMMON Base METALS
ALSO LACQUERED COLORS
SHEETS AND COILS
OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

Established 1898
AMERICAN NICKELOID COMPANY
PERU 1, ILLINOIS

Booth No.

Pressco Casting & Mfg. Corp. . . 1715
Chicago

To Exhibit—Copper base alloy castings produced by the permanent mold, die and centrifugal casting processes; zinc and aluminum die castings; powdered metal parts; ferrous and nonferrous stampings

Representatives—R. J. Dasse; W. B. McKenzie; S. E. Gregory

Production Machine Co. 1817
Greenfield, Mass.

Pyrometer Instrument Co. Inc. . . 302
Bergenfield, N. J.

To Exhibit—Micro and bi-optical pyrometers, pyro optical, radiation, immersion, surface and indicating pyrometers

Representative—A. Bollerman

RCA Victor Division, Radio Corp. of America 514
Camden, N. J.

See Radio Corp. of America

Radio Corp. of America, RCA Victor Div. 514
Camden, N. J.

To Exhibit—Permanent magnet electron microscope, type EMT; method of high frequency soldering of cans containing foods

Representatives—A. Hofberg, merchandise manager, industrial electronics; G. B. Russell and R. J. Miller, salesmen; D. Pendleton, merchandise manager, scientific; P. A. Greenmeyer, advertising section

Ransome Machinery Div. Worthington Pump & Machinery Corp. 506
Dunellen, N. J.

Rapids-Standard Co. Inc. 2457
Grand Rapids, Mich.

Raybestos-Manhattan Inc. Manhattan Rubber Div. 2130
Passaic, N. J.

To Exhibit — Reinforced foundry cut-off wheels in operation on a Tabor foundry cut-off machine, portable grinders with Moldisc for notching risers or trimming fins, rubber and resinoid bonded grinding wheels, diamond wheels for grinding cemented carbides

Representatives—W. H. Steinberg, sales manager; L. S. Hilton, assistant sales manager; F. E. Tiemann, district manager; H. Ahlers, C. M. Fleming, D. L. Cilley, sales engineers; E. E. Marlowe, Alex. Watchorn, E. G. Wilk, O. G. Harris, field engineers

Raytheon Mfg. Co. 2548
Waltham, Mass.

To Exhibit—Bench welding equipment: Model G Weldpower head, model 60, 225, and 1100 stored energy control units and model 5 kva, AC control unit

Reeves Pulley Co. Inc. 2020
Columbus, Ind.

To Exhibit—Variable speed transmission, Vari-Speed motor pulley, Vari-Speed Motodrive, fractional horsepower Motodrive capable of a 10:1 speed variation

Representatives—C. E. Hill, Chicago sales manager; Frank Moore; Gene Whitlock; Al Willi; Joe Gepfert; Ted Knoedler; R. A. Finnigan; W. G. Kerr; Frank Mitchell

Revere Copper & Brass Inc. 108
New York

To Exhibit—Customer applications of fabricated copper, its alloys and aluminum

Representatives—C. R. Gibbs, A. G. Putnam, Morgan Townsend, A. H. Copeland, S. P. Snyder, and C. R. Norlander of technical advisory service

Reynolds Metals Co. 1211
Louisville, Ky.

J. A. Richards Co. 1914
Kalamazoo, Mich.

To Exhibit—Multiform Big Brother air operated bender for fabrication of irregular shaped metal parts, springs, buss bars, aircraft modification or production work, etc.

Representatives—J. A. Richards Jr., Paul A. Richards, Robert E. Richards

Booth No.

Riehlé Testing Machines Div., American Machine & Metals Inc. 2025
East Moline, Ill.

Riverside Metal Co. 406
Riverside, N. J.

To Exhibit—Movie on production of phosphor bronze, nickel silver, cupro nickel, and beryllium copper alloys, from initial casting through final inspection and shipping; demonstration subjecting beryllium copper wire to testing in the Hunter fatigue tester

Representatives—J. T. Duffy Jr.; Alfred G. Dennison; James T. Duffy III; George Spanberg; P. B. Tursi

C. A. Roberts Co. 2435
Chicago

Rockwell Mfg. Co., Power Tool Div. 2701
Milwaukee

To Exhibit—Air hydraulic drill unit; 7-inch metal shaper; fully automatic repeat type, timer controlled 5-kva spot welder

Representatives—Otto Schmidt, district sales manager; Ben Eldridge, sales engineer; George A. Jensen and Goerge J. Groya, factory representatives; Lyman K. Shepard, experimental engineer

Rolock Inc. 522
Fairfield, Conn.

To Exhibit—Fabricated heat and corrosion resisting, job engineered equipment, designed for metal working trades

Representatives—R. P. Welles, president, Fairfield; Sales Representatives: W. F. Kinney, Detroit; E. A. Terwell, Chicago; S. G. Kroto, Cleveland; W. H. Martin, Indianapolis; C. H. Weber Jr., Fairfield

Ruemelin Mfg. Co. 2114
Milwaukee

Joseph T. Ryerson & Son Inc. 1016
Chicago

To Exhibit—Improved machinability of Rycut medium carbon alloy steel, parts machined from Rycut

Safety Clothing & Equipment Co. 2535
Cleveland

Safety First Shoe Co. 2520
Holliston, Mass.

To Exhibit—Industrial safety steel toe footwear, Street 'N' Shop safety shoes

Representatives—A. H. Crafts, sales manager; William Williams, representative; Louis Rubin and Gordon T. Vickery, service engineers

Sales Service Machine Tool Co. 1720
St. Paul, Minn.

To Exhibit—Press-Rite No. 1½-15 ton open back inclinable press, Press-Rite 15 ton press, Press-Rite 85 ton press

Salkover Metal Processing of Illinois Inc. 1814
Chicago

To Exhibit—Assemblies produced by various processes, copper brazed assemblies from the automotive industry, examples of silver brazing, aluminum brazing, etc.

Representatives—Lawrence Jacobsmeyer, executive vice president and general manager; Bert Anderson, sales manager; Edward J. McCrink, engineer; Lee Mathis, plant superintendent; N. M. Salkover

See also Technical Metal Processing

George T. Schmidt Inc. 2124
Chicago

A. Schrader's Son 518
Brooklyn, N. Y.

Sciaky Bros. Inc. 215
Chicago

C. U. Scott & Son Inc. 1235
Rock Island, Ill.

To Exhibit—Super Scottsonized parts

Representative—C. U. Scott, president

Scovill Mfg. Co. Inc. 518
Brooklyn, N. Y.

Selas Corp. of America 1127
Philadelphia

Reasons why another

COUPLER HOUSING *switched to*

UNITCASTINGS!

This warehouse trailer coupler housing is subjected to considerable stress and strain in handling materials for general factory use. As a weldment, it not only used 40 inches of welding, slowing down unit production, but lacked eye appeal.

After the switch to Unitcastings, production costs dropped 25%, trailer performance improved, a streamlined appearance added more "saleability" to the product . . . and with an eye to future repeat orders, Unitcastings created better customer relationships. To build quality into your own product, trust it to UNITCASTINGS—they're better.

UNITCAST
Corporation
QUALITY STEEL CASTINGS

Give us a chance to offer a "cast steel" answer for your parts problem. Our suggestions while your product is in the design stage will pay continuous dividends. Write or call today. Unitcast Corporation, Steel Casting Division, Toledo 9, Ohio. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

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your better source for all three

STEEL that resists corrosion — INGERSOLL SOLID STAINLESS

STEEL that resists heat — INGERSOLL HEAT-RESISTANT

STEEL that gives stainless protection at lower cost — INGERSOLL INGACLAD STAINLESS-CLAD

All are backed by Borg-Warner

Your inquiries are invited

Ingersoll STEEL DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue • Chicago 4, Illinois
Plants: Chicago, Illinois, New Castle, Indiana, and Kalamazoo, Michigan

ENGINEERING B-W PRODUCTION

Booth No.

Sentry Co. 602
Foxboro, Mass.

To Exhibit—High speed steel hardening furnace in operation demonstrating use and advantages of Diamond Black method of atmospheric control; facilities available for "on the spot" hardening of sample high speed steel pieces brought to the booth; high temperature tube furnace used for combustion analyses

Shell Oil Co. 315
New York

Sherman & Co. 1824
Flushing, N. Y.

Sinclair Refining Co. 2533
Chicago

Smith Welding Equipment Corp. 2518
Minneapolis

To Exhibit—Lite-O-Matic torch, flame of which automatically extinguishes and relights; line of welding and cutting torches; acetylene generators, AC arc welders

Representatives—N. L. Andrus, sales manager, Eastern Division; L. A. Thesenga, sales manager, Western Division; V. E. Lee, factory representative

Socony-Vacuum Oil Co. Inc. 2510
New York

South Florida Test Service 2620
Miami, Fla.

To Exhibit—Photographs of exposure facilities; test samples on exposure at inland proving grounds, salt atmospheric and marine locations; instrumentation for measuring and recording weather data; color slides depicting phases of service

Representatives—Warren W. Smith, chemical engineer; O. D. Pletcher, chemist

Special Welding Alloy Co. Inc. 2454
Long Island City, N. Y.

Spencer Turbine Co. 925
Hartford, Conn.

To Exhibit—Turbo compressors and gas-boosters

Representatives—R. A. Brackett, sales manager and vice president; N. S. Barnes, sales department; R. B. Richardson, sales representative, Detroit; R. B. Richardson Jr., Detroit; S. B. Shearer, Columbus, O.; C. S. Gardiner, Cleveland; H. A. Tossell; Indianapolis, Ind.

Sperry Products Inc. 228
Danbury, Conn.

To Exhibit—Ultrasonic Reflectoscope, ultrasonic Reflectogage, hydraulic remote controls, self-sealing couplings

Representatives—John L. Bradley, advertising manager; William C. Minton, sales and service engineer; Ralph H. Frank, D. Jack LaClair, Robert W. Renner, Glenard D. Smith, sales engineers; L. F. A. Mitchell, general sales manager; John C. Smack, district sales manager; Frank J. Pringle Jr., sales and service engineer

Standard American Engineering Co. 2743
Lyons, Ill.

To Exhibit—Radivection heat treating furnace

Representatives—Al W. Davis, sales manager; Frank Zadel, general manager; R. F. Webster, advertising manager

Standard Electrical Tool Co. 2743
Cincinnati

To Exhibit—No. 55 grinder, Twin-Wheel carbide tool grinder

Representatives—W. A. Ferguson, president; Jack J. Falls, vice president; Ray A. Huhn, secretary and general manager; J. J. Klopp, treasurer; P. P. Wagener, Chicago district representative

Standard Oil Co. of Indiana ... 2659
Chicago

Standard Pressed Steel Co. 2434
Jenkintown, Pa.

L. S. Starrett Co. 2438
Athol, Mass.

To Exhibit — Mechanic's hand measuring

LUBRICATION DAN SEZ: EDISON GAVE US LIGHT IN 1879

In 1876 Brooks PUT NEW LIGHT ON LUBRICATION

CHECK THESE 9 IMPORTANT FACTS:

1. EXTREME PRESSURE pH-lim STRENGTH of 30,000 lbs. per square inch minimum by "Timken" testing machine.
2. ADHESIVENESS in which affinity for steel and other metals develops maximum adhesion and prevents drippage or creeping. Retains a flexible coating in nature.
3. WATER REPELLENCE which retards washing off, creates a lubricating pH-lim under moisture or water conditions.
4. CORROSION PREVENTION is an excellent protective coating in that it will not etch or corrode metals. Is never acidic.
5. COMPOUNDED STABILITY—Will not bleed or change physical condition within range of higher than usual temperatures for this type of lubricant.
6. LOW TEMPERATURE FACTORS—While having a solidifying action by decreased temperature as low as —40 F., it does not harden, crack or decrease in adhesion. The flexible coating withstands distortion of the application.
7. ABRASIVE RESISTANCE—Extremely high for a lubricant. Does not wipe off nor will be removed in handling by workman's hands or gloves. Is extremely repellent to adhesion of scale, metallics and other forms of dusts or contamination.
8. Klingfast has remarkable corrosive resistance to salt or sea water, acidic vapors and solutions.
9. Klingfast can be removed by ordinary solvents such as kerosene, gasolene, naphtha, carbon-tetrachloride and similar substances but is highly impervious to lubricating oils and greases.

NOW it can be told! An important manufacturer of ferrous material—one of the most critical buyers in the industry—test and set up their own lubrication specifications—*and it has to be a top quality lubricant to meet them.* KLINGFAST met all these rigid tests with "flying honors" and notification has been sent to all of their plants to use KLINGFAST on *open gears* and many other tough jobs. Proof again that Brooks Products, in the face of strict competition, rigid specifications, and the toughest job applications, are superior.

Talk over your "tough" assignment with the Brooks engineer when he visits your plant—or write today for outstanding case histories of Brooks Lubricants—*on the job.*

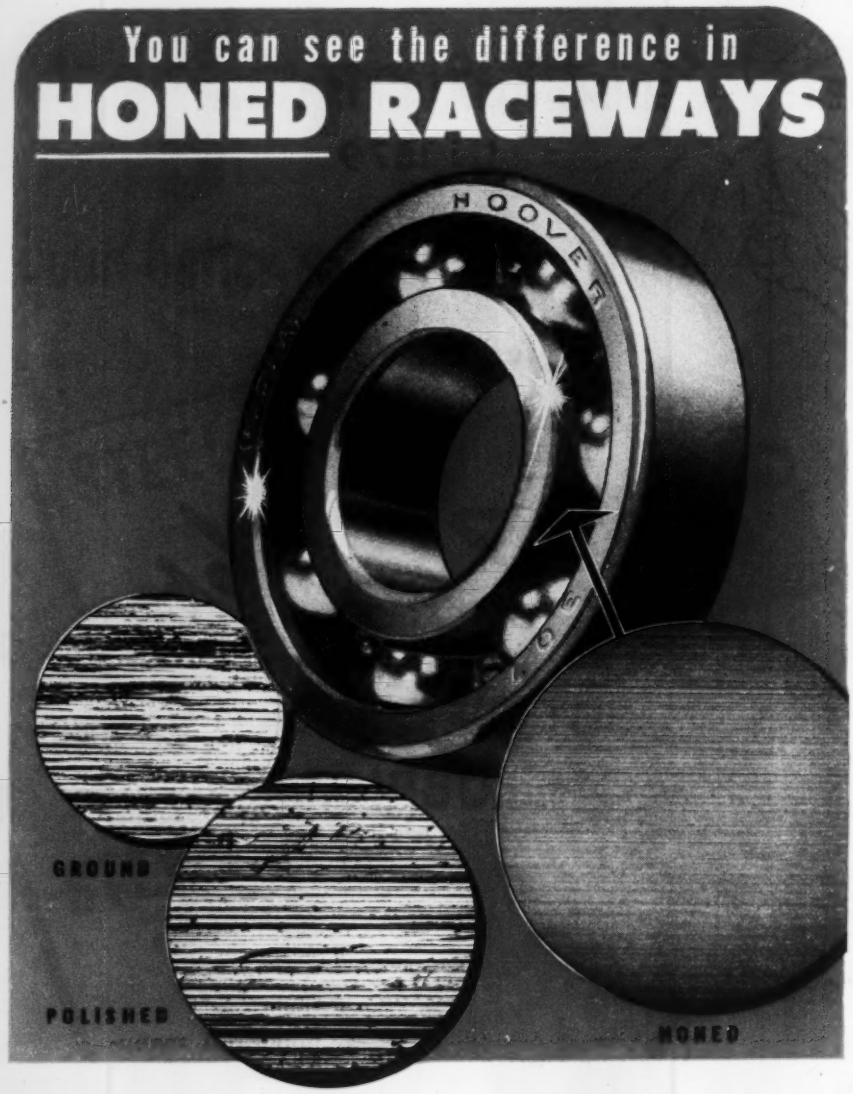
The Brooks Oil Co.
Since 1876

Pittsburgh 12, Pennsylvania
Cleveland, Ohio
Hamilton, Ontario

Warehouses: In Principal Industrial Cities

You can see the difference in

HONED RACEWAYS

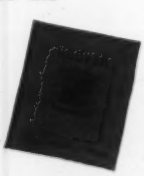


exclusive with

HOOVER BALL BEARINGS

The photographs reproduced above are magnified one hundred times so you can see the difference between ground, polished and honed raceways. The process and the special machines for the honing operation are exclusive, patented, Hoover developments. Honing by Hoover goes far beyond grinding and polishing to achieve a surface that assures amazing quietness plus *90 per cent longer bearing life . . . 30 per cent greater load capacity.* That's why Hoover Ball Bearings are the choice of distinguished American manufacturers of fine machines and equipment.

The Hoover Engineering Manual will be mailed free to engineering and purchasing executives requesting a copy on their business letterhead.



THE ARISTOCRAT OF BEARINGS

HOOVER BALL and BEARING CO.
Ann Arbor, Michigan

Booth No.

tools and precision instruments, dial indicators, steel tapes, hacksaws, band saws, band knives, precision ground flat stock

Representatives—W. W. Haskins, Western sales manager; R. J. Norwalk, Chicago branch manager

STEEL 1925
Cleveland

Representatives—E. L. Shaner, editor-in-chief; Irwin H. Such, editor; Walter J. Campbell, managing editor; Guy Hubbard, machine tool editor; Dan Reebel, associate editor; J. W. Zuber, business manager; G. R. Ebersole, manager, circulation department; K. A. Zollner, New York, D. C. Kiefer, H. G. Rowland, W. L. Poland, Cleveland, L. C. Pelott, V. G. Brettman, Chicago, business staff; E. A. Franke, manager, Readers' Service; H. R. Dunne, circulation representative

Steel City Testing Machines Inc. 2519
Detroit

Steel-Parts Mfg. Co. 2552
Chicago

To Exhibit—Metalok roller conveyor which features speed and ease in attaching one length to another

Representatives—L. H. Gray, executive vice president; G. E. Walk, sales manager; A. M. Rosinia, assistant sales manager; J. A. Walz, purchasing agent; Frank Delano and George Heery, sales representatives, Chicago; Robert June Sr., Robert June Jr., and Jack June, sales representatives, Detroit; P. Hasselberger, field engineer; E. M. Plett, chief engineer

Edwin B. Stimpson Co. 1820
Brooklyn, N. Y.

F. J. Stokes Machine Co. 420
Philadelphia

To Exhibit—Four-ton powder metal press producing small brass machine parts

Representatives—L. H. Bailey, chief engineer; S. Bradbury, manager, Powder Metal Division; J. Kuzmick, engineering consultant; G. Karian, engineer; R. V. D. Strong, Chicago district manager

Stoody Co. 1615
Whittier, Calif.

To Exhibit—Westinghouse automatic electric welding head on which tractor rollers will be rebuilt and hard faced, automatically hard-faced parts, castings produced by Stoody process of Co-Cr-W materials, including steel mill roller guides, entry guides, tin mill bearings and bushings, extrusion cylinders for die casting, seaming rolls and similar pieces

Representatives—George F. Staley, general sales manager; C. E. Rogers, sales metallurgist; Ralph S. Thompson, advertising manager; Robert A. Hand, automatic specialist; Charles C. Hand, field engineer

N. A. Strand Div., Balmar Corp. 2635
Chicago

Streeter-Amet Co. 2715
Chicago

To Exhibit—Scientific and industrial counters, time interval recorder, predetermined counter, Traficounters

Representatives—V. C. Kennedy, president; R. T. Isham, supervisor of production; V. C. Kennedy Jr., supervisor of engineering; Paul Becher, production department; J. A. Marquardt, engineering department; W. R. Daniels and R. E. Lash, sales department

D. A. Stuart Oil Co. Ltd. 328
Chicago

Stud Welding Div., K S M Products Inc. 2733
Merchantville, N. J.

Superior Tube Co. 2435
Norristown, Pa.

Surface Combustion Corp. 1106
Toledo, O.

To Exhibit—Actual equipment and pictorial representation of all types of furnaces in operation, MRX-800 prepared atmosphere generator

Representatives—F. H. Adams, president; C. B. Phillips and W. M. Hepburn, vice presidents; H. M. Heyn, sales manager, Heat Treat Division; A. H. Koch, in charge of standard industrial equipment; A. L. Hollinger, sales manager, Steel Mill Division; W. J. Grover, marketing director; E. G. deCoriolis, research director; W. O. Owen; H. J. Gregg; W. M. Dempster; W. F. Herdrich; E. Stephenson; L. I. Sieloff; J. M. Brown; E. H. Jeffries; G. J. Langendorfer;

R. M. Sharpe; E. W. Weaver; H. W. Schramm; R. C. Wayne, R. W. Elmenthaler

Technical Metal Processing Inc. 1814
Cleveland

To Exhibit—Assemblies produced by various processes, copper brazed assemblies from the automotive industry, examples of silver brazing, aluminum brazing, etc.

Representatives—Frank Humberger, executive vice president and general manager See also Salkover Metal Processing of Illinois Inc.

Tempil Corp. 515
New York

To Exhibit—Special Tempil temperature indicating pellets used in reducing atmospheres at temperature levels where the standard pellets may be influenced by the gases present. Standard Tempil pellet series in range from 113° to 2500° F; Tempilaq in range from 1600 to 1950° F

Representatives—D. R. Kasanof, president; Dr. G. M. Wolten, technical director; A. B. Tesmen, sales engineer; M. P. Lacks, production manager

G. H. Tennant Co. 2528
Minneapolis

Texas Co. 1906
New York

To Exhibit—Texaco cutting lubricants and coolants; two transparent animations, one of cutting threads, the other of grinding threads; machine parts showing the high finish secured with lubricants and coolants

Timken Roller Bearing Co. 1006
Canton, O.

To Exhibit—Turbo-jet aircraft engine developed by Allison with turbine blades made from special alloy 16-25-6, automobile transmission with overdrive, cut-away automatic transmission in operation, a deep well oil pump, golf clubs and fishing rods made from Timken tubing, other parts made from either tubing or bars

Representatives—W. B. Moore, vice president in charge of sales; C. H. McCollam, general sales manager, Steel and Tube Division; D. S. Klippert, assistant general sales manager, Steel and Tube Division; A. R. Attebury, district manager, New York; R. P. Donnell, district manager, Cleveland; J. T. Irwin, district manager, Chicago; Jack Brigham, salesman, Chicago; L. W. Eppler, district manager, Detroit; R. L. Wilson, director of metallurgy; P. J. Reeves, advertising manager; S. T. Salvang, sales promotion manager; Peter C. Poss, assistant advertising manager

Tin Research Institute Inc. 2565
Columbus, O.

Tincher Products Co. 2641
Sycamore, Ill.

Tinnerman Products Inc. 1825
Cleveland

Titanium Metals Corp. of America 2207
New York

Tocco Div., Ohio Crankshaft Co. 910
Cleveland

Toolskill Co. 2636
Chicago

Torit Mfg. Co. 2537
St. Paul, Minn.

Representatives—E. A. Davenport, Chicago territorial representative; B. J. Shields, Chicago; Edward J. Girk, vice president in charge of sales

Tracerlab Inc. 2420
Boston

To Exhibit—Beta gage for continuously gaging metal sheets directly on production line; examples of radiography work done with cobalt-60; laboratory equipment for radioactive research

Tyler Mfg. Co. 2249
New York

To Exhibit—15-inch bandsaw, Spyral blade

Representatives—Elie J. Hakim, Jack Hocket, of Marlie Trading Inc., Eastern representatives for Tyler

Uddeholm Co. of America Inc. 2734
New York

Udylite Corp 907
Detroit

To Exhibit—Device which will automatically take loaded racks from a conveyor chain, and place them on work carrier rail of

Lining up Logan Alligator Switch with inside loop for handling unfinished coils to mill. Air operated escapement stop and brake in switch release one coil at a time. Switch tongue is shifted manually from one loop to the other.

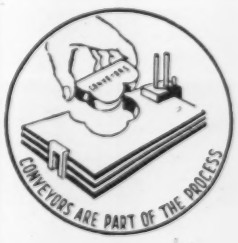
PARTNERS of PRODUCTION MEN

Year in — year out — Logan Conveyors are an ever-present aid to production personnel, from operators to supervisors.

It is a "partnership" which could develop only with dependable handling equipment.

Two generations of service to the steel and metal-working industry qualify Logan engineers and fabricators to produce conveyors which will take the gaff, perform efficiently and make economies in time, effort and space right down the line. Logan is a good name to specify.

Now is the time to conveyorize every possible operation, for maximum benefits. Write for literature or for an engineer to call, today.



Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

No, No, Plunkett!

The Modern coat is Pre-coat!

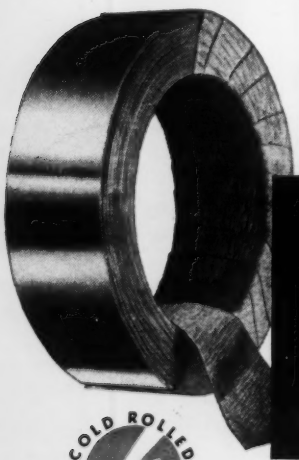
Pre-coated THOMAS STRIP, to be specific. It's cold rolled strip steel in a wide selection of electrocoated finishes. It's the coat that "does things" for you . . . makes your products handsome and eye-catching. Tailored to fit your fabricating equipment to a "T", THOMAS STRIP can save you the costs of operating plating lines.

★ ★ ★

Yes, ready-to-use *pre-coated* THOMAS STRIP will dress your product in modern style . . . splash it with color . . . and do it economically! It combines the beauty and utility of non-ferrous surfaces with the economy of steel. It serves as an already-applied final product finish, or as a ready base for further plating. Use it to eliminate costly batch plating and buffing of formed and drawn parts.

Fabricate THOMAS STRIP as you will. The base steel—uniform in gauge and workability—is furnished metalurgically right for your processes and products. And, most THOMAS coatings—Zinc, Brass, Copper, Tin or Lead Alloy—lubricate stamping dies, stretch die life, give you added production per grind.

Be modern—Go THOMAS! We'll be glad to show you *pre-coated* THOMAS STRIP samples, and to arrange for a test run in your plant. Just write:



THE THOMAS STEEL COMPANY
WARREN, OHIO
Specialists in Cold Rolled Strip Steel

Thomas Strip
SPEEDS PRODUCTION . . . CUTS COSTS

COLD ROLLED STRIP STEEL

Electrocoated with Zinc, Copper, Brass, Nickel and Chromium • Hot Dipped Tin and Lead Alloy • Lacquer Coated in Colors • Annealed Spring Steel • Alloy Strip Steel • Uncoated Strip Steel • Produced to Your Specifications.

Booth No.

automatic electroplater, and then remove a rack of plated parts and return them to conveyor

Union Carbide & Carbon Corp. 901
New York
See Haynes Stellite Division

U. S. Electrical Motors Inc. 2637
Los Angeles
To Exhibit—Varidrive motor, synchrogear motor, explosion-proof and double enclosed motor, uniclosed motor, sanitary motor
Representatives—R. G. Liebmann, central division manager; R. M. Green, Chicago district manager; H. J. Poplis and E. J. Phillips, field engineers; V. F. Launspach, sanitary motor specialist, Chicago

United States Pipe & Foundry Co. 803
Burlington, N. J.
To Exhibit—Metal mold centrifugal castings in gray and alloy iron, carbon and alloy steel and all grades of stainless steels, as well as dual metal combinations of two dissimilar metals

Universal Castings Corp. 2724
Chicago

Univertical Machine Co. 2712
Detroit
To Exhibit—Gilding metal hammers, electrolytic anodes, soldering irons
Representatives—Charles T. Walker, A. L. Waha, Fred Redpath, Ray Ribant

Upton Electric Furnace Co. 2736
Detroit

Verson Allsteel Press Co. 122
Chicago
To Exhibit—High production progressive and transfer type metal stampings, press brake, press equipped with safety bolster
Representatives—Walter C. Johnson, assistant sales manager; Emmet J. O.'Connell, advertising manager; Melvin D. Verson, sales engineer; E. A. Kaster and H. A. Pederson, sales engineers

Vlier Mfg. Co. 2636
Los Angeles

Wallace Supplies Mfg. Co. 114
Chicago

Warner Div., Clinton Machine Co. 201
Detroit

Wells Mfg. Corp. 2708
Three Rivers, Mich.

Martin Wells Inc. 2541
Los Angeles

Western Cartridge Co. 2502
East Alton, Ill.
To Exhibit—Western brass, Super-X phosphor bronze, Super-X nickel silver, and copper sheets or strips, in coils and lengths; Products of other Olin units and customers
Representatives—M. W. Acker, M. F. Meissner, D. T. Marvel, H. M. Campbell, E. N. Rousseau, M. M. Randle, J. S. Allen, A. M. Tull, C. C. Barnett Jr., H. M. Lehmkuhl

Westinghouse Electric Corp. 622
Pittsburgh

Wheelco Instruments Co. 1909
Chicago
To Exhibit—Limitrol, indicating high temperature cut off; model 192 indicating pyrometer; tin content meter
Representatives—Charles L. Saunders, executive vice president; C. A. Gates and R. A. Schoenfeld, vice presidents; R. Miller, R. Meridith, R. Larsen, H. Dahlke, W. Paetz, W. McFarland, J. Haynes, J. Borchert, G. Hubbert, sales; B. Ramthun and C. Claeson, application engineers; H. Bluethe, and J. Freyberg, advertising

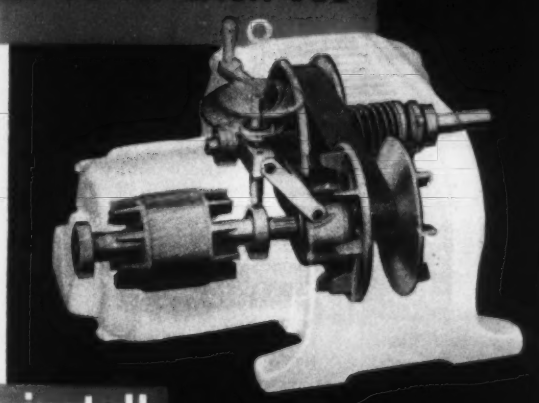
Wilson Mechanical Instrument Co. 519
See American Chain & Cable Co., Inc.
New York

Wilson Welder & Metals, Inc. 422
New York

Worthington Pump & Machinery Corp. 506
Harrison, N. J.
To Exhibit—Model 75 turning roll; model 60 3-ton welding positioner for hand and automatic welding, other sizes of welding positioners, Worthington Allspeed drive unit, rotary coolant pump, centrifugal coolant pump

don't increase payroll

INCREASE OUTPUT OF MACHINES BY CHANGING SPEED TO FIT EACH JOB



...install

Varidrives

The Varidrive pays you big dividends because you get more work out of your machines and operators by instant-change variable speed. The Varidrive tremendously increases the scope of powered equipment by coordinating the speed to each duty, condition or machining requirement. You can step ahead of competition by producing better quality products at top speed.

U.S. VARIDRIVE MOTORS

1/4 TO 50 H. P. • 1 TO 10,000 R. P. M.
Ask for Bulletin

U.S. ELECTRICAL MOTORS, Inc.
Atlantic Plant: Milford, Conn. • Pacific Plant: Los Angeles 54, Calif.

Clip this Chart for Reference

CHEMICALS ACP PROCESSES

SPECIFICATION CHEMICALS FOR THE GOVERNMENT AND ITS CONTRACTORS

CHEMICALS ACP PROCESSES

Phosphatizing, Rust Proofing and Paint Bonding Chemicals

SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL
QQ-P-416	"Lithoform"
	"Zinodine"
RR-C-82	"Lithoform" No. 32
MIL-C-5541 (See also QPL-5541-1)	"Alodine"
MIL-S-5002	"Alodine"
	"Granodine" (Dip, Spray and Brush grades)
JAN-C-490, Grade I	"Granodine" (Dip, Spray and Brush grades)
JAN-F-495	"Granodine" (Dip, Spray and Brush grades)
	"Lithoform"
JAN-L-548	"Permadine"
AN-E-19	"Alodine"
	"Zinodine"
AN-F-20	"Alodine"
	"Granodine" (Dip, Spray and Brush grades)
	"Lithoform"
	"Permadine"
	"Thermoil-Granodine"
	"Zinodine"
	(See also U.S.A. 3-213)
U.S.A. 57-0-2	
Type II, Class A	"Thermoil-Granodine"
Type II, Class B	"Permadine"
Type II, Class C	"Granodine" (Dip, Spray and Brush grades)
U.S.A. 51-70-1	
Finish 22.02, Class A	"Thermoil-Granodine"
Finish 22.02, Class B	"Permadine"
Finish 22.02, Class C	"Granodine" (Dip, Spray and Brush grades)
U.S.A. 50-60-1	"Granodine" (Dip, Spray and Brush grades)
U.S. Navord O.S.675	"Alodine"
U.S.N. Appendix 6	"Lithoform"
Navy Aeronautical M-364	"Permadine"
	"Thermoil-Granodine"
AN-C-170	(See MIL-C-5541)
U.S.A. 72-53	(See AN-F-20)
AXS-1245	(See JAN-C-490)

Rust Removing and Metal Conditioning Chemicals

SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL
JAN-C-490, Grade II	
Type 4	"Deoxidine" Nos. 126, 512, 526, 624, 670
Type 5	"Deoxidine" Nos. 170, 171, 670
U.S.A. 3-213	
Type I	"Deoxidine" (Wash-off grades)
Type II	"Deoxidine" (Wipe-off grades)

Metal Cleaning Chemicals

SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL
JAN-C-490, Grade II	
Type 2	"Ridoline"
Type 6	"Ridosol"
U.S.A. 3-192	"Ridoline" No. 3192
U.S.N. Appendix 6	"Deoxidine"

Acid Inhibitors, Pickling

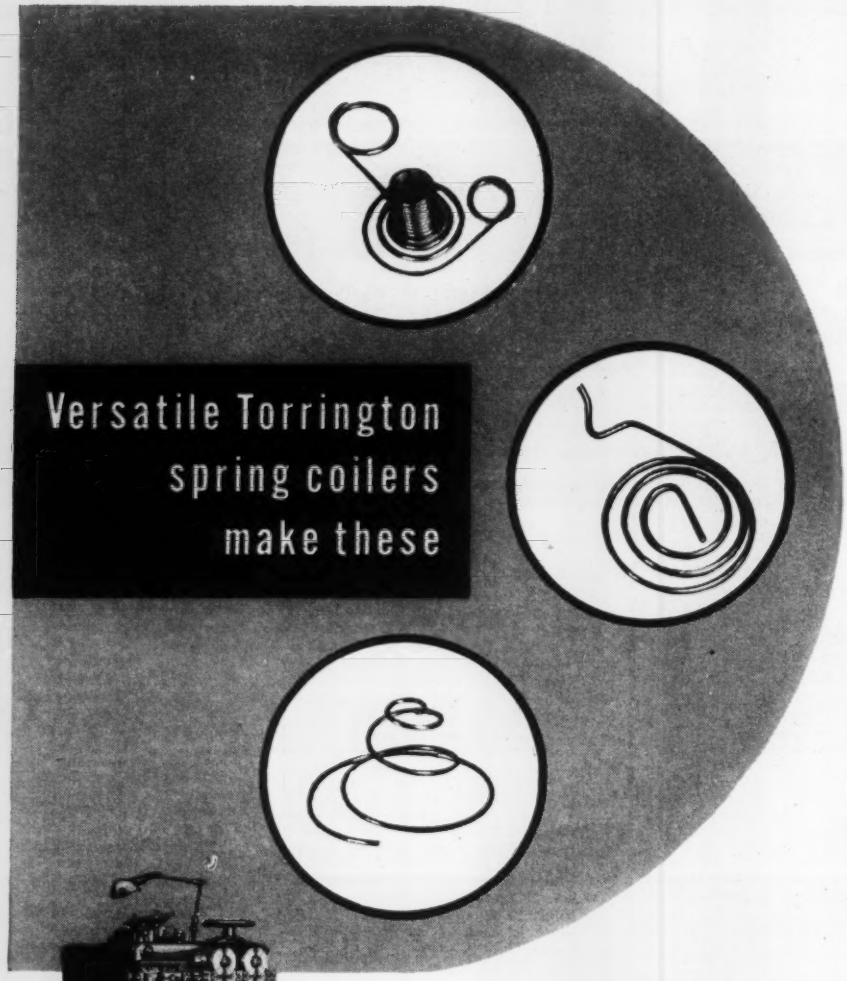
SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL
U.S.N. 51-1-2	"Rodine"

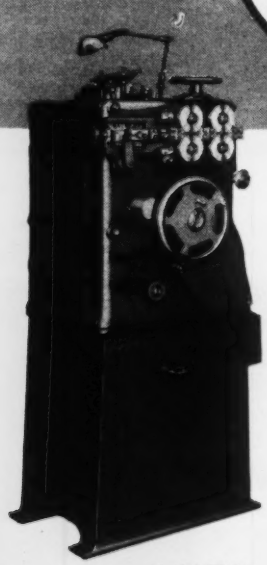
Write us for descriptive folders and further information on the specification chemicals listed above. Additional copies of this chart are available on request.

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY
AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals





Model W-11, one of fourteen versatile Torrington Spring Coilers

PLUS an amazing range of other intricate springs that meet the most exacting requirements. Professional springmakers from coast to coast agree that a Torrington Spring Coiler can't be beat for speed, accuracy and economy. Your professional springmaker who owns a Torrington spring coiler can make springs to your special needs. If you're uncertain about a source of supply for a special spring you want, our sales department will help you find it or help your springmaker devise tooling to produce it.

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

Wire Length per Spring: 9" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive

Torsion and other attachments available.

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

CALENDAR OF MEETINGS

† *Denotes first listing in this column*

Oct. 16-17, Boston Conference on Distribution, Hotel Statler, Boston. Sponsored by Boston Chamber of Commerce, 80 Federal St., Boston 10.

Oct. 16-18, Southwide Chemical Conference: Meeting, Biltmore Hotel, Atlanta, Ga. Sponsored by American Chemical Society, 60 E. 42nd St., New York 17, and Southern Association of Science and Industry, Atlanta, Ga.

Oct. 16-19, Society of Automotive Engineers: Transportation meeting, Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York 18.

Oct. 16-20, National Safety Council: 38th National Safety Congress and Exposition, Chicago. Meeting in Stevens, Congress, Morrison hotels. Council is located at 425 N. Michigan Ave., Chicago 11.

Oct. 18-19, National Conference on Industrial Hydraulics: Sixth annual meeting, Sherman Hotel, Chicago. Sponsored by Armour Research Foundation and seven Chicago technical societies. Conference director: Otto J. Maha, Hannifin Corp., 621 S. Kolmer, Chicago 24.

Oct. 18-19, Shock & Vibration Symposium: Sixteenth meeting, Armour Research Foundation, Chicago. Sponsored by Naval Research Laboratory, Washington 25, D. C.

Oct. 18-20, Society of the Plastics Industry: Annual national conference, New Ocean House, Swampscott, Mass. Society headquarters: 295 Madison Ave., New York 17.

Oct. 23-25, American Institute of Electrical Engineers-Institute of Radio Engineers: Conference on electronic instrumentation in nucleonics and medicine, Park Sheraton Hotel, New York. AIEE address is 33 W. 39 St., New York 18; IRE is 1 E. 79th St., New York 21.

Oct. 23-25, American Gear Manufacturers Association: Semiannual meeting, Edgewater Beach Hotel, Chicago. Association is located at Empire Bldg., Pittsburgh 22.

Oct. 23-26, American Institute of Steel Construction: Annual meeting, Shamrock Hotel, Houston, Tex. Institute address is 101 Park Ave., New York 17.

Oct. 23-26, Wire Association: Annual convention, Lord Baltimore Hotel, Baltimore, Md. Association is located at 300 Main St., Stamford, Conn.

Oct. 23-27, American Institute of Electrical Engineers: Fall general meeting, Oklahoma City, Okla. Institute offices are at 33 W. 39th St., New York 18.

Oct. 23-27, National Metal Congress and Exposition, International Amphitheatre, Chicago, sponsored by American Society for Metals. Participating society addresses and Chicago headquarters: ASM, 7301 Euclid Ave., Cleveland, 3, Palmer House; American Welding Society, 29 W. 39 St., New York 18, Hotel Sherman; Institute of Metals Division, American Institute of Mining & Metallurgical Engineers, 29 W. 39th St., New York 18, Hotel Sheraton; Society for Non-Destructive Testing, Skokie, Ill., Morrison Hotel.

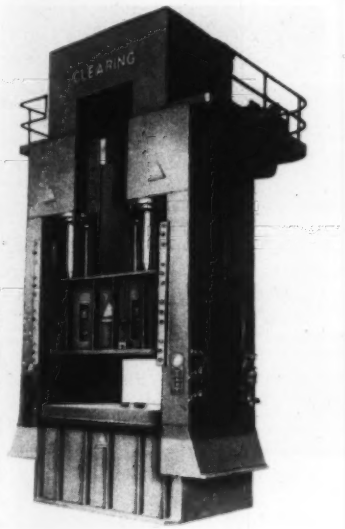
Oct. 24-25, Westinghouse Materials Handling Conference, Hotel Statler, Buffalo, N. Y. For further information write Westinghouse Electric Corp., Box 1017, Pittsburgh 30.

Oct. 25, American Iron & Steel Institute: Regional technical meeting, Hotel Thomas Jefferson, Birmingham, Ala. Institute headquarters: 350 Fifth Ave., New York 1.

New Products and Equipment

No Blankholder Pressure Lost

Possibility of losses in blankholder pressure during the punch stroke are eliminated by two independent hydraulic circuits on the line of double action presses made by Clearing Machine Corp., Chicago, Ill. With one circuit for the blankholder slide and the other for the punch slide, each with its separate pump, the pressure on each corner of the blankholder may be individually adjusted, making the presses suitable for eccentric or irregular draws besides the more regular runs. Hydraulic circuits use valves for reversal.



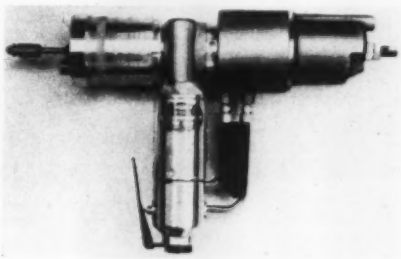
Provision is made for slowing the punch slide at the instant the blankholder slide is picked up on the return stroke. This action eliminates the shock encountered when the punch slide picks up the motionless blankholder. A positive drive for both slides allows gibbing to be set closely. Press illustrated has a 72 x 108-inch bed and is arranged for an 18-inch draw and lift out, including redraw work using an inside blankholder.

Check No. 1 on Reply Card for more Details

Countersinking Is Automatic

Supplying its own thrusting action, a portable air powered countersinking tool made by Buckeye Tools Corp., 29 W. Apple St., Dayton 1, O., has a self-locking grip which holds the tool firmly to the work sheet while operating. Made under a license granted Boeing Airplane Co., the tool is almost completely automatic in operation, requiring no operator effort other than inserting the mandrel in the hole to be countersunk. Mandrel expansion locks it in operating position.

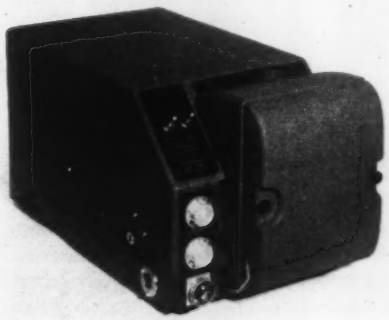
Drilling speed and depth of cut are predetermined and automatically controlled. When operation is completed, the mandrel contracts, permitting removal of the tool from the hole. Designed for countersinking holes ⅜-inch diameter and larger, the tool is available in capacities ranging from ¾ to 1⅛ inches across the mouth.



Check No. 2 on Reply Card for more Details

Variable Speed Oscillograph

Utilizing a wide range of record speeds from ¼ to 100 inches per second is the model 5-116 recording oscillograph, built by Consolidated Engineering Corp., 620 N. Lake Ave., Pasadena 4, Calif. It consists of a webbed-base casting upon which are mounted all of the major components except the operational system, and a front casting with operational controls and components of the permanently fixed optical system. Neither sprocket teeth nor pressure roller are required to provide positive record engagement. A ten-speed transmission is incorporated.



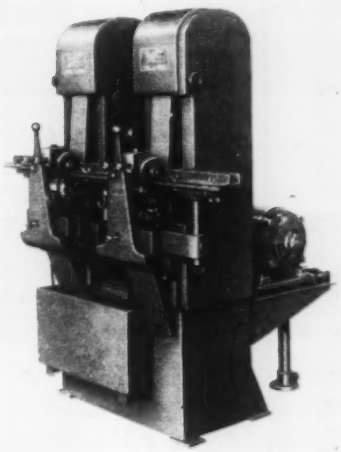
Projection of high-intensity light in controlled beams onto the galvanometers eliminates objectionable stray light. A prefocused galvanometer lamp contributes to high-quality records. Unit is capable of writing speeds of approximately 25,000 inches per second on Eastman Linagraph 1127. Speeds approximating 50,000 inches per second are optional. Oscillograph is designed to use series 7-200 galvanometers.

Check No. 3 on Reply Card for more Details

Polishing Machine Is Centerless

Small cylindrical work may be given various types of finish on the model 484 duplex polishing machine built by Production Machine Co., Greenfield, Mass. Equipped with two polishing heads, the machine employs abrasive, felt, leather or fabric belts, depending on finish desired.

It has a capacity of up to 1½ inches diameter. It will perform a two-pass polishing operation on metal, plastic and other materials within its weight limitations. Only a single handling of material is required; many parts may be fed to the machine automatically by hoppers or fixtures suitable for the individual application.



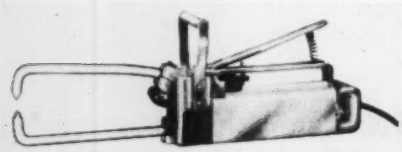
Check No. 4 on Reply Card for more Details

33-Pound Portable Welder

Easy conversion into a stationary model is a feature of the model BW self-contained portable spot welder developed by Greyhound A. C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y. Possessing increased power, faster welding, easier handling and automatic switch control, the portable tool weighs about 33 pounds and is capable of welding up to ¼-inch combined thickness of mild or stainless steel, or two pieces of 16 gage galvanized metal with a combined thickness of ⅛-inch.

Automatic switch control eliminates any finger movement. A slight squeeze of the spot welder handle applies pressure to the welder tips; an extra

squeeze turns on the current. Copper welding arms are available in three interchangeable lengths of 6, 12 and 18 inches, plus a variety of special shapes and sizes. Water-cooled arms and tips may be furnished for heavy gage intermittent operation. For uni-



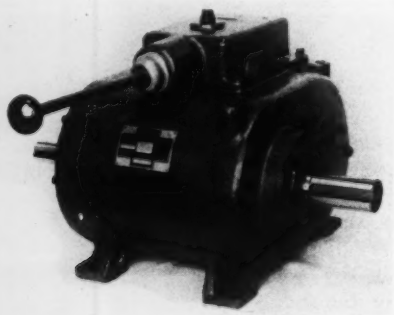
form welds, it can be operated with a timer to automatically cut off the current at any desired time-dwell. Mounted on a metal stand, operating pressure is applied to a foot press pedal.

Check No. 5 on Reply Card for more Details

Antifriction Transmission

Four speed changes in geometric progression from 1.7 to 1 to 5 to 1 are available with the model 420 transmission made by Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich. Of 20 hp capacity with input speed of 900 rpm, the unit has a case large enough to accommodate special ratios to 9 to 1.

All gears and shafts are alloy steel, heat treated and with shaved gears.



Revolving shafts are mounted on antifriction bearings and the case is oil sealed.

Check No. 6 on Reply Card for more Details

Hoist 95 Per Cent Efficient

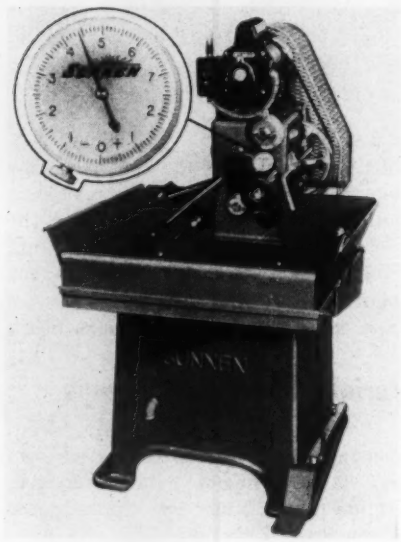
One man can lift a capacity load of 1000 pounds to 3 feet in 20 seconds with the Yale hand chain hoist introduced by Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. The 37-pound Load King operates at 95 per cent efficiency. High strength aluminum castings and alloy steel, plus fewer parts are responsible for the light weight.

A load brake synchromatic provides automatic braking when hoisting or lowering. Balanced and cushioned springs force engagement of the six-tooth pawl and 24-tooth ratchet, assuring immediate braking action without harmful side pressure on bearings.

Check No. 7 on Reply Card for more Details

Controls Honing Size

The precision indicator gage actuated by the stone feed up dial is being offered for honing machines made by Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo. As the hole is honed larger, the stone feeds up automatically. The gage



shows how fast and how much the stone feeds up and tells when to gage the hole.

All model MBB Sunnen honing machines may be equipped with the size control gage, as well as certain model MB and MBH machines. Use is said to make it possible to hold close tolerance and eliminate rejected parts.

Check No. 8 on Reply Card for more Details

Induction Motors Redesigned

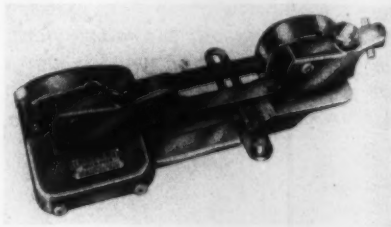
More protection and greater accessibility have been redesigned into the line of large, bracket-bearing, squirrel-cage induction motors made by Allis-Chalmers Mfg. Co., Milwaukee, Wis. Use of split, cast-iron bearing capsule or housing with machined flange for bolting the bearing bracket permits removal of the upper half of the bracket for inspection or cleaning without exposing the inside of the bearing. Air-discharge openings in the side of the stator yoke, protected by removable louvers, facilitates vacuum cleaning or blowing out.

Splash-proof motors with internal baffling of air passages are available. The large stator air-discharge openings facilitate installation by providing adequate headroom for drilling and doweling the machine to its foundation. Motors are offered with special electrical modifications to suit application requirements.

Check No. 9 on Reply Card for more Details

Feeds for Coiled Material

H. E. Dickerman Mfg. Co., Springfield, Mass., is offering a 2½-inch feed for handling lighter gages of stock from 0.003 to 0.050-inch in thickness. Designed to have greater



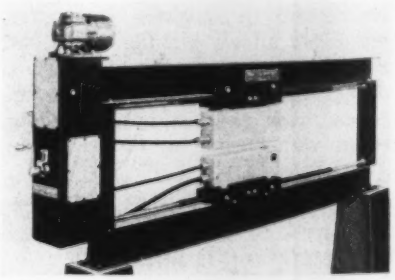
control of the stock, the feed makes possible feeding of these lighter gage materials without buckling.

Mounting may be on any press or to the dieset. Unit will handle feeding of intricate multistation progressive dies, as well as simple blanking and piercing dies. No tools are required to make adjustments for gripping pressure or feed lengths. Design automatically maintains proper gripper plate angle. Massive main frame and moving members and Carboloy wear and gripping plates extend the service life.

Check No. 10 on Reply Card for more Details

Measures Edge-to-Edge

It is possible to scan and gage the full width of continuous strip material with the application of a traverse mounting to the beta ray continuous mill gage made by Pratt



& Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn. Rate of scanning is from 18 to 30 inches per minute and the operation is completely automatic. Limit stops set on the rail of the traverse mounting automatically reverse the gaging heads when they reach the edges of strip, scanning then continuing in the opposite direction.

Alliance

FIRST IN SIZE
FIRST IN CRANE DESIGN

INDUSTRY WANTS SAFETY, YOU GET SAFETY WITH ALLIANCE CRANES

● Dependably safe! That's this 4-girder Alliance Ladle Crane. With a wide safety factor, it's engineered to operate 24 hours daily year after year with unbelievable minimum of maintenance. This powerful crane is equipped with an auxiliary trolley having a 60-ton and 20-ton hoist, safety rope reeving and synchronized worm drive, and a safety compartment containing a duplicate bridge master control. This lets the operator move the crane in safety in case hot metal is accidentally spilled. Another Alliance safety feature is the enclosed stairway leading from the cab to footwalk on the crane girder.

Known the world over, Alliance Cranes handle more hot metal than any other make. Alliance has constructed the largest cranes ever built considering height and capacity of lift.

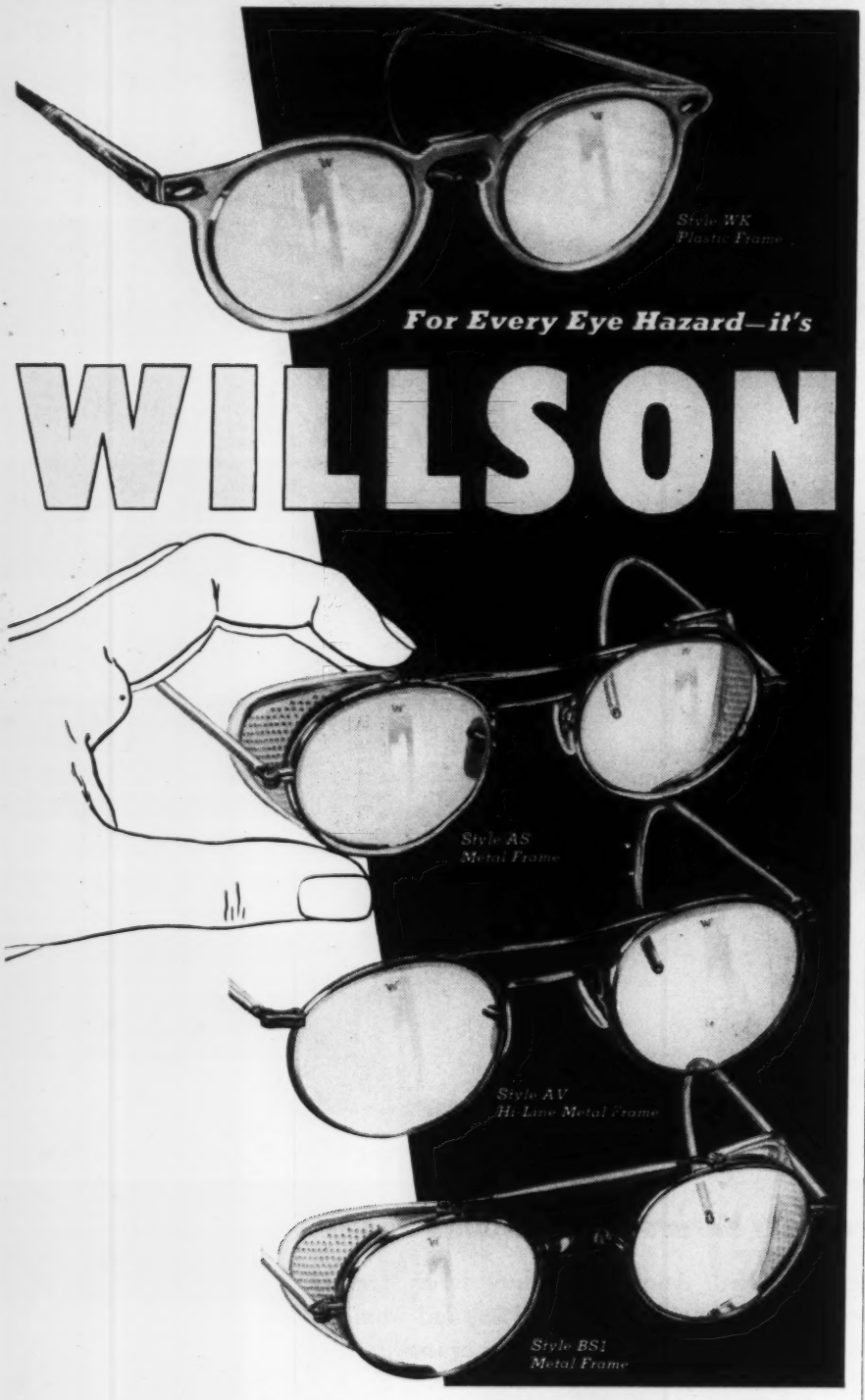
Think now about giving your plant more lifting power by developing new cranes or reconverting old ones.

BIG CRANES

THE ALLIANCE MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO • PITTSBURGH OFFICE 1622 OLIVER BUILDING, PITTSBURGH, PA.

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION



WILLSON*
Dependable Products Since 1870
*T.M. Reg. U.S. Pat. Off.

Protection • Comfort • Appearance

. . . only the most complete line of safety spectacles with Super-Tough* lenses gives you *all three* in metal or plastic frames. You'll find WILLSON safety spectacles an ideal combination of strength, comfort and good looks. And you need *all three* to get full cooperation from workers who must wear eye protection. See our new catalog for complete information. Get it from our nearest distributor, or write direct to WILLSON PRODUCTS, INC., 233 Washington St., Reading, Pennsylvania.

This mounting permits a complete cross-sectional and logitudinal analysis of the material being processed. Recorders are available for use with the gage and process control or alarm circuits may be incorporated. Gage is noncontacting.

Check No. 11 on Reply Card for more Details

Air Gaging Spindle

Practically all types of air gages may use adjustable gaging plugs or spindles marketed by Sheffield Corp., Dayton 1, O. They are of the ball-jet contact type and available in either through-hole or bind-hole style for measuring internal diameters within all or any part of a range

from 1 to 3 inches. No master rings are required for setting the spindle to size, this being done with a special fixture and gage blocks.

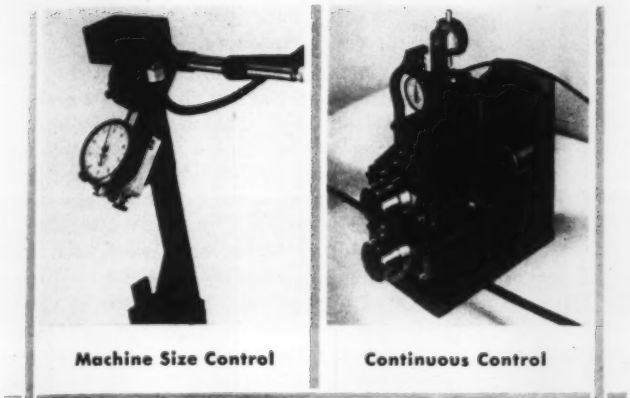
Adjustable air spindle consists of tapered core and four clamps to hold blades in place, together with a set of four blades, two of which have inserted ball-jets. Full range of 1 to 3 inches can be covered with four sets of blades and eight cores. The 1-inch range is covered with two blades and eight cores. Only one minimum and one maximum setting ring are required.

These gaging spindles are recommended for air gates having amplification of 2000 to 1 or less and may also be used with higher amplification.

Check No. 12 on Reply Card for more Details

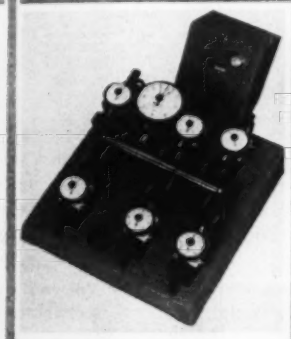
Collet Chuck Speeds Production

Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O., is offering a hydraulic collet chuck and bar feed as standard accessory for its No. 3, 4 and 5 turret lathes. Unit includes a bar feed stand, chuck-type bar feed head, control valve with single lever for all functions plus the necessary hydraulic equipment. Bar feed chuck jaws are manually adjusted with chuck wrench for the proper degree of gripping and the collet is adjusted in the usual manner.



Machine Size Control

Continuous Control



Multi-dimension Gaging

Automatic Gaging

FEDERAL "Electricator"

IT'S VERSATILE. Federal "Electricator" combines the tried and proven features of the Dial Indicator with an electrical power circuit. You can use the "Electricator" for high-speed precision gaging — for precision machine control — for automatic sorting of parts — for controlling processes. In fact, there's practically no limit to the gaging versatility of the "Electricator" . . . or to its ability to reduce waste and cut costs.

IT'S COMPACT. The "Electricator" fits into the same space as a Dial Indicator. A multiple-dimension "Electricator" gage not only shows the size condition on the Dials . . . it reveals faulty workpieces instantly by flashing a *single* control signal. You can't beat it!

IT'S A PRODUCTION TOOL. For controlling plunge-cut grinding, for continuous process control, for automatic high-speed sorting, the "Electricator" pays off in greater precision and increased inspection output. Take the automatic grinding gage, for example. You get up to twice as many parts per hour from your machines and *no waste* — these parts are 100% O.K. within a tenth (.0001").

You can get profit-making, cost-cutting help with the Federal "Electricator". Write for more information. Federal Products Corporation, 2110 Eddy Street, Providence 1, R. I.

FEDERAL

Largest manufacturer of indicating type gages . . . exclusively.

THE TOUGHER THE CUTTING JOB . . .

. . . THE BETTER THE OPPORTUNITY FOR

abrasive cutting

This is *one* job outside the sphere of abrasive cutting . . . but . . .

Allison wheels *will* cut accurately and fast . . . through the toughest materials . . . with little or no need for after-finishing.

Call an Allison Abrasive Cutting Expert! As specialists in this specific field, our men are well qualified to recommend the right wheel and best equipment to help you reduce costs on your cutting operations.

We like tough jobs

. . . consult us about yours!

THE ALLISON COMPANY

257 Island Brook Ave.
Bridgeport 8, Conn.

Allison

ABRASIVE CUTTING WHEELS

NEW for better welding of high tensile steels

ARCOS TENSILEND

Low Hydrogen Electrodes

These new Tensilend Electrodes have been developed and added to the Arcos low hydrogen family to help you overcome fabricating problems on high tensile steels. Tensilend 70 is the electrode that will fit the widest range of applications. Tensilend 100 and 120 provide unique properties to meet specialized requirements that can be met by no other electrodes.

No Preheat Needed
When welding low alloy or high carbon steels

Underbead Cracking Eliminated
Stainless type coating controls hydrogen

Superior Physicals
High ductility and impact strength

Savings In Electrode Inventory
One electrode welds high strength, low alloy steels, mild steel under highly restrained conditions, or sulphur-bearing free machining steels.

ARCOS CORPORATION
1500 South Fiftieth St., Philadelphia 43, Penna.

The ABC'S of Welding High Tensile Steels

Write for bulletin that will square you away on low hydrogen electrodes in simple question and answer form and tell how to get better welding of high tensile steels.

WELD WITH

ARCOS

Specialists in Stainless, Low Alloy and Non-Ferrous Electrodes

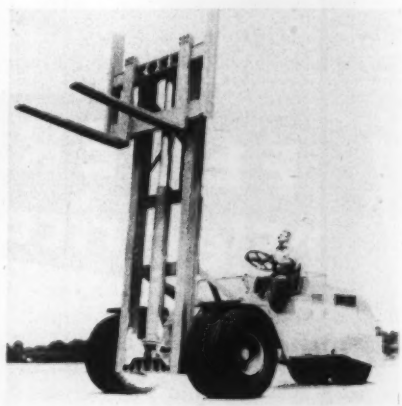
The pressure gage indicates degree of collet tightness.

After a bar has been loaded in the stand and the bar chuck jaws are set, a forward pull on the headstock-mounted control lever actuates the hydraulic mechanism to advance the bar for a distance which has been predetermined by adjusting nuts. Pushing the lever away from the operator closes the collet and reverses the pusher head travel. Collet chuck and bar feed is offered in two sizes, one for the No. 3 or 4 machine and the second applicable to the No. 5 turret lathe.

Check No. 13 on Reply Card for more Details

Heavy Load Handler

Capable of handling loads weighing 26,000 pounds and 72 inches wide is the series 24 lift truck on pneumatic tires, introduced by Ross Carrier Co., 600 Miller St., Benton Harbor, Mich. The 14.00-20 pneumatic tires, plus sufficient weight of the driving wheels, enables operation in



yards having a minimum of prepared surfacing. Power is furnished by a heavy duty 126 hp gasoline engine. A heavy duty spiral bevel differential drive axle with chain drive to a stationary load axle is a feature, along with hydraulic hoisting, tilting and steering.

Check No. 14 on Reply Card for more Details

Fixture Grinds Many Surfaces

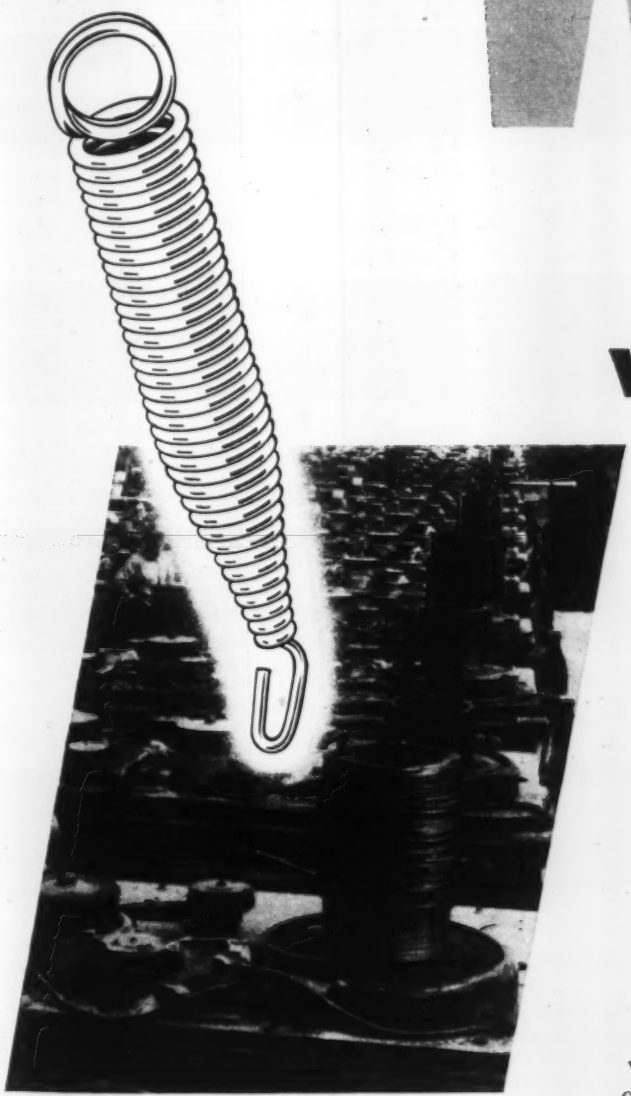
Any combination of cylindrical surfaces, tapers, indexed sections, splines, grooves, radii or other forms may be closely ground with concentricity of form by the Starco master grinding attachment, offered by Star Gauge Co. Inc., 261 Oak Grove Ave., Springfield, Mass. Almost any combination of surfaces may be ground in a single setting using only a surface grinder.

Attachment embodies features which contribute to savings in setup: Sine plate held to within 0.0001-inch, allowing rapid setup for tapers; 12

HARD DRAWN MB SPRING WIRE

by

WICKWIRE



The above is one of a battery of wire drawing machines in our Buffalo Plant.

Wickwire Hard Drawn MB Spring Wire is used in the manufacture of a wide variety of mechanical springs.

Like all Wickwire specialty steel wires, this high carbon wire can be depended on for unvarying uniformity of quality, size, tensile strength and stiffness. That's because every step of its production — starting in our own open hearth furnaces — is under constant control, subject to uncompromising testing, checking and inspection.

Wickwire leadership in wire making is based on long experience, skilled craftsmanship and completely integrated facilities. Our engineers and metallurgists welcome an opportunity to apply this specialized knowledge and skill to your particular wire problem. High or low carbon steel . . . round or shaped . . . in all tempers, grades and finishes . . . when you need wire, it pays to call on WICKWIRE.

WICKWIRE WIRE

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A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 Delaware Ave., Buffalo 2, N. Y. . . **EXECUTIVE OFFICE**—500 Fifth Ave., New York 18, N. Y.

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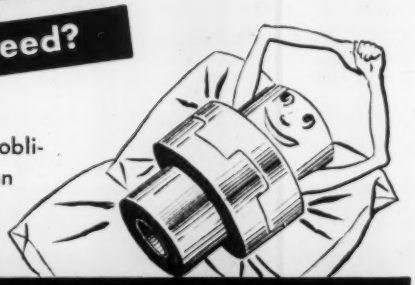
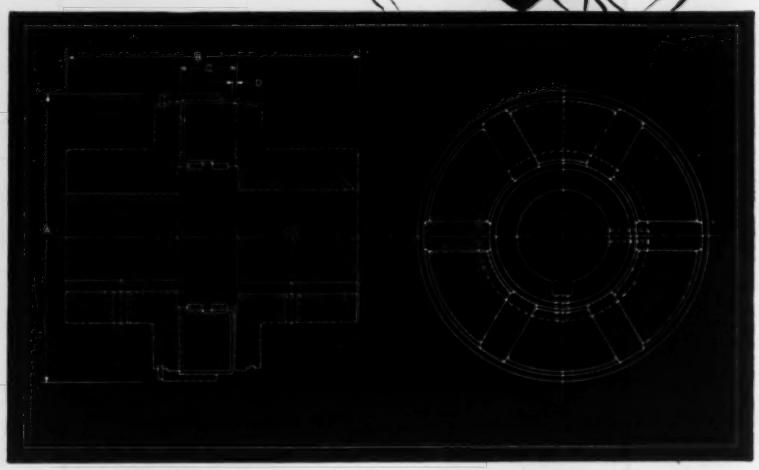
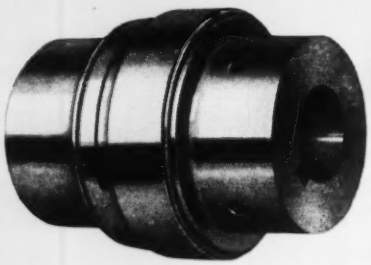
PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corp., Oakland 6, Cal.

How many cushions do Your couplings need?

Lovejoy will promptly, without obligation, give the correct answer on your supply of data, h.p., kind and conditions of service.







LOVEJOY L-R FLEXIBLE COUPLINGS

Simplified to the last degree! Ruggedly built of most enduring materials! Lovejoy Couplings give longest service with minimum attention. Every duty from 1/6 to 2500 h.p.

Lovejoy L-R Type "H" for heavy duty. Electrical steel castings, and greater number of jaws provide far greater load capacity. Pat. & Pats. Pend.

- NO LUBRICATIONS
- MAINTENANCE FREE
- NO SHUT-DOWNS FOR CHANGING CUSHIONS

Send for complete Catalog . . . Selector Charts lead you right to the couplings you need.

Tough, resilient, free-floating load cushions are suspended between metal jaws. Cushions in plain sight, can be removed and replaced in minutes.

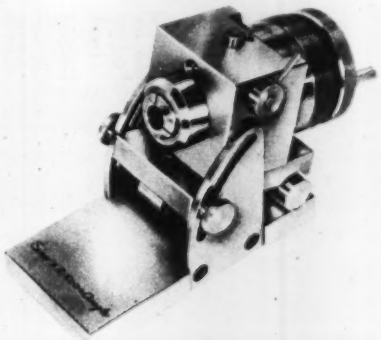
LOVEJOY FLEXIBLE COUPLING CO.

Manufacturers of Lovejoy Variable Speed Transmissions

5071 W. LAKE ST. • CHICAGO 44, ILLINOIS

Also manufacturers of Lovejoy Universal Joints.

stops held to within 1 minute which permits rapid indexing of common divisions; a finely cut dividing head and vernier setting for odd angles, settings being provided for any angle within 2½ minutes. Unit itself is

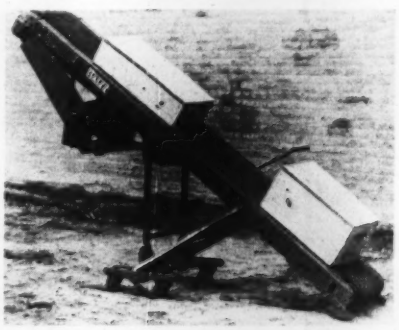


hardened and ground square with the spindle. Unit can be placed under the wheel of the surface grinder and may be removed for checking purposes without losing the setting.

Check No. 15 on Reply Card for more Details

Conveyor Eases Truck Loading

Bags, boxes, cartons, etc., may be moved from ground level to a convenient height above the truck body by a light weight package conveyor made by George Haiss Mfg. Co. Inc. Division, Pettibone Mulliken Corp.,



141st St. and Park Ave., New York 51, N. Y. The model 485-C unit is of channel frame construction. Conveyor is made portable by installation of caster wheel or pneumatic tire mountings.

Check No. 16 on Reply Card for more Details

Speeds Small Parts Grinding

Precision grinding of small parts is facilitated by two improved gang vises manufactured by Dery Tool & Die Co., Pine Meadow, Conn. Offered in three and six-position models, the vises handle intricate grinding jobs. Both incorporate equalizing blades which automatically compensate for

Check these Points

BEFORE you buy CHAIN

1 FUNCTION OF CHAIN

2 WORKING LIMIT LOAD

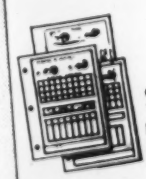
3 PERMISSIBLE SIZE AND WEIGHT

Then "Engineer"

McKAY CHAIN

to your specific needs

The use for which the chain is intended and working conditions under which it will operate often determine the type of chain to be used for the job. That's why it's important to check the above points *before* buying chain. Call on McKay to help "engineer" McKay Chains to your exact requirements. Then you'll be sure you're getting the best chain to do the job efficiently and economically



Send for the McKAY SLING-CHAIN KIT

It gives standard sling-chain specifications and shows how to specify sling and other chains used in plants and shops.

THERE'S A McKAY CHAIN FOR EVERY JOB

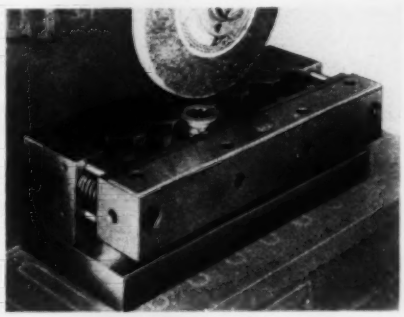
THE McKAY COMPANY

446 McKAY BUILDING

PITTSBURGH 22, PA.

differences in work tolerances and eliminate "toeing in" of undersize parts.

Three-position model is designed for use with magnetic chuck but can be modified for clamping to conventional chuck. Vice holds work in a central position, making it possible to turn the fixture for grinding the opposite side without additional adjustment. Capacity of the three-position model is ¾ x 1½ inches. Six-position vise is for use with magnetic or non-magnetic chuck, its capacity ranging from ⅛ to 1 inch. It may also be turned without adjustment.

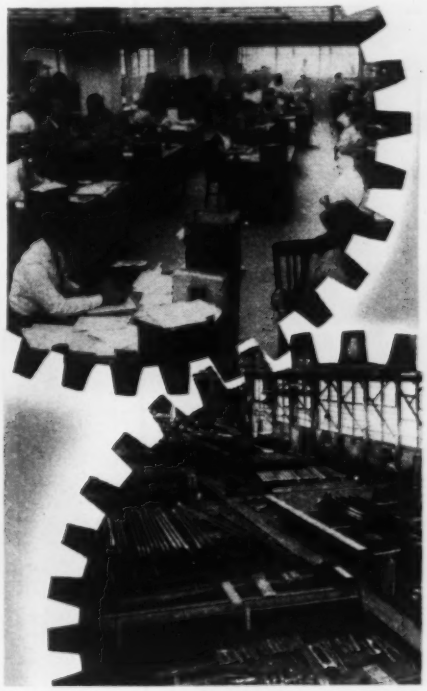


Check No. 17 on Reply Card for more Details

Hand-Operated Arbor Press

Providing 800 pounds of pressure for pressing small shafts, gears wheels and bushings is the HP-600 arbor press made by H. D. Herder Tool Specialties, 2723 E. Michigan Ave., Kalamazoo, Mich. The frame, table and table standard are close-grained cast iron, braced and accurately machined for strength and rigidity.

Base of frame has 1-inch arbor opening and is finished to serve as auxiliary table. Ram bearings in frame are machined vertical to table. Three slots are provided in the press table for arbor work, being ¼, ½ and ¾-inch wide. Table and table stand-



Geared

TO TODAY'S CONDITIONS

Once again the Nation is confronted with an almost war-time emergency. Once again metals are difficult to procure. Here at Levinson our entire organization has already been geared to meet today's new problems. Conditions may have changed but Levinson's policy of close customer cooperation never changes. *This means . . .*

1. We will use every means at our command to try to supply our customers, even on a limited basis.

2. We will spare no effort to help you work out any of your problems in connection with the economical use of metals.

3. We will never deviate from our long established policy of never charging a premium for anything—*regardless of conditions.*

LSS-7

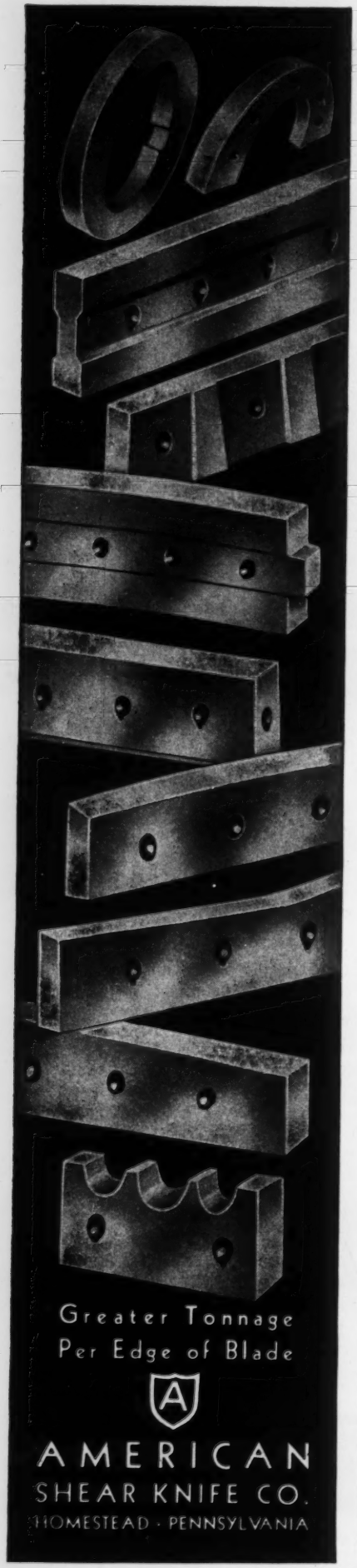
Levinson

STEEL SALES CO.

20TH AND WHARTON-STS., S. S.

PITTSBURGH, PA.

Warehouse Aluminum & Steel Products



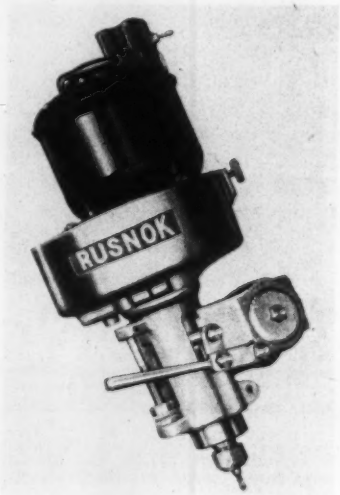
ard may be removed for large work. Capacity over table is 2¾ inches and over base, 5 inches. Largest work diameter which may be handled is 5⅝ inches.

Check No. 18 on Reply Card for more Details

Add Versatility to Milling

For bench, light floor or heavy mills is the Convertical quill travel vertical mill attachment, a development of Rusnok Tool Works, 4840 W. North Ave., Chicago 39, Ill. Attachment allows full use of table travel and features rapid, rigid angular settings, both single and compound.

Five spindle speeds of 380, 700, 1200, 2500 and 5200 rpm are incorporated. Changes are through slight rotation of the motor. Quill travel is 1½ inches. Attachment has locking micrometer depth stop graduated in thousandths.



Check No. 19 on Reply Card for more Details

Drum Sling Fills Hoppers

A single workman can easily and quickly replenish hoppers of molding and tabletting machines using a drum sling developed by F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia, Pa. Drums holding up to 300 pounds of material and measuring 16 to 24½ inches in diameter and 24 to 36 inches in height can be accommodated.

Sling is placed on the floor and drum placed on the lower support member at floor level. Upper support member is secured by two handwheel screws; entire unit is raised by chain hoist to a position over the hopper. Rotation is on pivot bolts at center of gravity. Canvas sleeve with shut-off valve unfolds from the inverted

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Whether you come by train, plane or motor . . . for business or pleasure . . . you'll like the convenience of comfortable, friendly Hotel Cleveland. Only a few steps by covered passage from Union Terminal trains and garage. Close to theatres, sporting events, stores, office buildings. Quiet, sleep-inviting rooms . . . spirited, colorful new decorations . . . attentive service and sincerely warm hospitality will greet you.

All rooms with radio . . . many with television. Singles from $4.50, doubles from $6

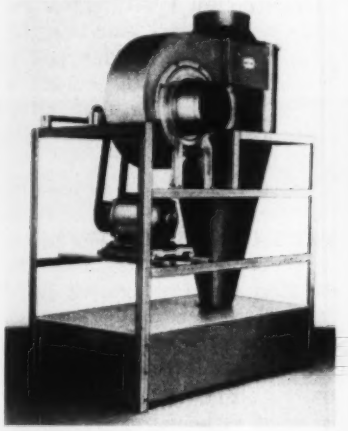
HOTEL CLEVELAND
Cleveland, Ohio

top support and receives the material which flows from the drum.

Check No. 20 on Reply Card for more Details

Packaged Dust Collector Unit

Available as a standard pretested unit ready for shipment from stock is the model 90N50 Dustkop dust collector, built by Aget-Detroit Co., Ann Arbor, Mich. It is designed for separating industrial dust from the air



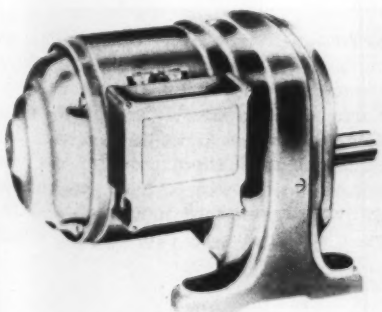
stream and discharging cleaned air and toxic fumes out-of-doors.

Capacity of 10,050 cfm is developed by a 15 hp motor driving a paddle wheel fan. Static suction of 4 inches on a 15-inch inlet is observed on instrument test. Size of outlet for discharge of cleaned air to out-of-doors is 18 inches in diameter. Motor is available for operation on 220 or 440 v, 3-phase, 60-cycle power. Other motors can be supplied.

Check No. 21 on Reply Card for more Details

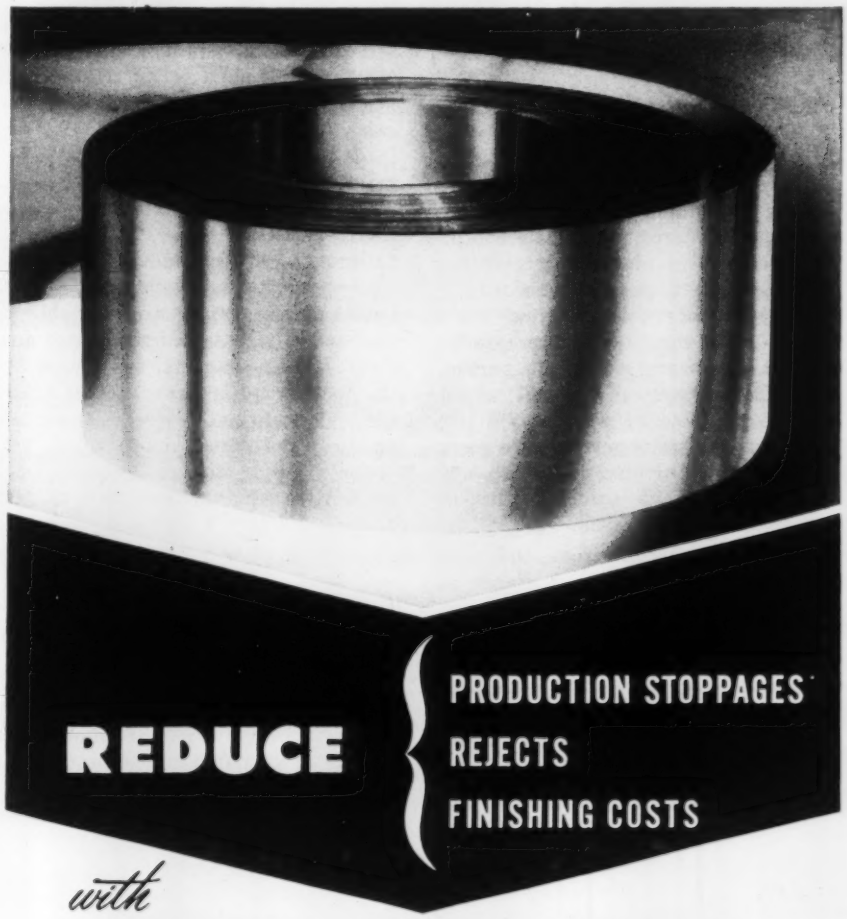
Capacitor on Gear-Head Motor

Sterling Electric Motors Inc., Los Angeles, Calif., is offering its Slo-Speed geared electric power drives



in single phase, capacitor type design. The gear-head motors are built in single or double reduction gear types, providing speeds from 30 to 780 rpm in ratings ½ to 3 hp.

They utilize a starting relay which eliminates necessity of centrifugal



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WALLINGFORD

Custom-Tailored

STRIP STEEL

Wallingford steel is cold processed to meet your most exacting requirements. Precision rolling and slitting, with the latest equipment, provides you with your specified width and thickness tolerances every inch of the way. With this Wallingford custom-tailored strip you obtain uniform fabrication characteristics; eliminate costly production stoppages and high rejects; improve your profit picture.

LOOK TO WALLINGFORD STEEL FOR LEADERSHIP IN THE PRODUCTION OF:

STAINLESS STRIP — Up to 24" in all grades. Bright Annealed 18-8 — To 15" wide — From .005 gage. Mirror-like surface materially reduces finishing costs.

HIGH AND LOW CARBON STRIP AND COIL — Closer gage tolerances mean fabrication of more finished parts per hundred pounds of steel.

RESISTANCE WELDED TUBING — From strip to tube, every inch a Wallingford Quality Controlled product.

INVESTIGATE WALLINGFORD'S PRODUCTS TODAY. AN INQUIRY ON YOUR COMPANY LETTERHEAD WILL BE PROMPTLY ACKNOWLEDGED.

THE WALLINGFORD STEEL CO.

SINCE 1922

WALLINGFORD, CONNECTICUT, U.S.A.

LOW CARBON • HIGH CARBON

ALLOY • STAINLESS • STRIP and TUBING

switches or other rotating devices. Features of two and three phase motors are retained.

Check No. 22 on Reply Card for more Details

Tumbling Barrel Resists Warping

Long life and ability to resist warping are advantages claimed for the Tumb-L-Dur burnishing machine, developed by Lupomatic Industries, Inc., 4510 Bullard Ave., New York 66, N. Y. Available as either portable or stationary units, the barrels are molded from a material which may be kept out of water when not in use. Barrel perforations are small, permitting use of small-size shot. A removable screen facilitates separation of work from shot.

To remove work from the machine, a perforated tray is placed in it and the machine given a half-turn. Balls automatically separate from the work. Unit is completely automatic. Models are offered in capacities ranging from ½ to 2¼ gallons.

Check No. 23 on Reply Card for more Details

• • •

STOPS SMALL LEAKS: Swagelok fittings, made by Crawford Fitting Co., Cleveland, O., provide a vacuum tight seal to eliminate small leaks. Fittings will hold heavy or thin wall tubing equally well and are made for use with tubing material of aluminum, brass, copper, steel, stainless steel and plastic. They are available in sizes for use with tubing ⅛ to 1-inch outside diameter.

Check No. 24 on Reply Card for more Details

CARBIDE DRILL: For use in the Cleco Handi-Drill, Reed Roller Bit Co., Houston, Texas, announces a new carbide drill. Capacities are ½ to 1 inch with lengths of 6, 12, and 18 inches available.

Check No. 25 on Reply Card for more Details

BETTER GRIPPING: Resilient follow-up action, self-alignment of the gripping faces and positive restraint of motion of the gripping surface in direction of pull are features of the new type tensile testing machine jaws offered by Instron Engineering Corp., Quincy, Mass. Jaws are available in four models.

Check No. 26 on Reply Card for more Details

SUPPORTS 1500 POUNDS: Thompson Electric Co., Cleveland 14, O., is producing a new heavy-duty, adjustable beam clamp to suspend heaters, motor platforms, lighting fixtures, blowers, conveyors, and similar overhead mounted equipment. The cast malleable iron beam clamp can be attached to standard I, inverted T or H beams as well as trusses and girders consisting of angles or channels back-to-back. It will support loads to 1500 pounds.

Check No. 27 on Reply Card for more Details

COLD-FORGED CASTERS: Series 41 and 42 Rapistan industrial casters offered by Rapids-Standard Co. Inc., Grand Rapids, Mich., are available in four wheel sizes and both swivel and rigid types. Casters are made by the cold-forged process. Wheels available include nicrosteel, Durastan plastic, Soft-Tred and Hard-Tred (rubber) and Mold-on rubber, with capacities ranging from 260 to 900 pounds.

Check No. 28 on Reply Card for more Details

CIRCULAR SAW SHOP: A complete bench machine for sharpening and fitting circular saws, is announced by Belsaw Machinery Co., Kansas City 2, Mo. It handles jointing, gumming, tooth forming and setting of all popular wood and metal cutting circular saws.

Check No. 29 on Reply Card for more Details

SOLVENT CLEANER: Cyclodiene, a liquid hydrocarbon solvent degreaser fluid for all metals, is introduced by Colonial Alloys Co., Philadelphia 29, Pa. It dissolves greases, oils, buffing compounds and other dirts. The liquid is used at room temperature and requires no heating. It can be distilled and used over again.

Check No. 30 on Reply Card for more Details

GEAR BOX: Link Aviation Inc., Binghamton, N. Y., announces the Hi-Reduction gear box that has practically no backlash development during life of the unit. The teeth are cut to 72 spur diametral pitch, minus 20 degrees pressure angle. Unit may be used for both reduction and step up purposes.

Check No. 31 on Reply Card for more Details

OVERCURRENT RELAY: Type CO-10 relay, offered by Westinghouse Electric Corp., Pittsburgh 30, Pa., has extremely inverse current time characteristics. It co-ordinates with fuse curves over a wider range of currents and can frequently be used to advantage where a long-time delay is required for light overloads.

Check No. 32 on Reply Card for more Details

SAFEGUARD FOR GAS BURNERS: A new Fireye system providing complete flame failure protection and programming for industrial and commercial automatic gas burners, is available from Combustion Control Corp., Cambridge 42, Mass. The programming control automatically starts and programs the burner in operation and the electronic flame rod type 45JQ1 will not allow the main gas valve to open until the pilot flame is established and detected.

Check No. 33 on Reply Card for more Details

LIQUID SAMPLE COOLER: For cooling boiler and boiler feedwater samples, a new liquid sample cooler is introduced by Worthington Pump & Machinery Corp., Harrison, N. J. It is a shell and tubular coil type heat exchanger of all welded construction designed so that all connections are external to both cooling coil and jackets.

Check No. 34 on Reply Card for more Details

ROLLER CONVEYOR: Metalok roller conveyor, available from Steel-Parts Mfg. Co., Chicago 44, Ill., features a new type coupling and lock that makes it easy to attach one length to another and lock them in place.

Check No. 35 on Reply Card for more Details

COVERS FOR CONNECTORS: Kwi-Cover, new covers for electrical taps, are announced by O. Z. Electrical Mfg. Co. Inc., Brooklyn, N. Y. They give positive protection to tee, parallel and two-way connectors. Covers are available for XTP, XW, PT and PM group of connectors in the company's line.

Check No. 36 on Reply Card for more Details

TWO SPEED DRILL HEAD: The new two-speed, all-angle head drill, developed by Cummins Portable Tools, Chicago 40, Ill., has a low speed of 275 rpm for deep boring and a high speed of 1100 rpm for small holes and drilling lumber. The head rotates through the full 360 degrees.

Check No. 37 on Reply Card for more Details

SPEED REDUCER: Designated as model 5-E, a new Heliocentric speed reducer is offered by Universal Gear Corp., Indianapolis 7, Ind. It is suitable for any straight-line installation in which the input revolutions per minute do not exceed 1800. Maximum torque capacity is 1000 inch-pounds.

Check No. 38 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

IMPACT of defense orders is more pronounced in the steel markets. Product shortages are becoming noticeably acute, necessitating curtailment in civilian goods manufacturing operations. Some fabricating shops are reducing activities because of the stringency in structural shapes. At least two manufacturers of refrigerators have scaled back schedules due to the flat-rolled steel shortage. Similar cutbacks in other lines loom. Generally, however, civilian goods manufacturers are maintaining operations at high level and expect to continue to do so through the remainder of the year despite the growing encroachment of emergency demands on steel supply.

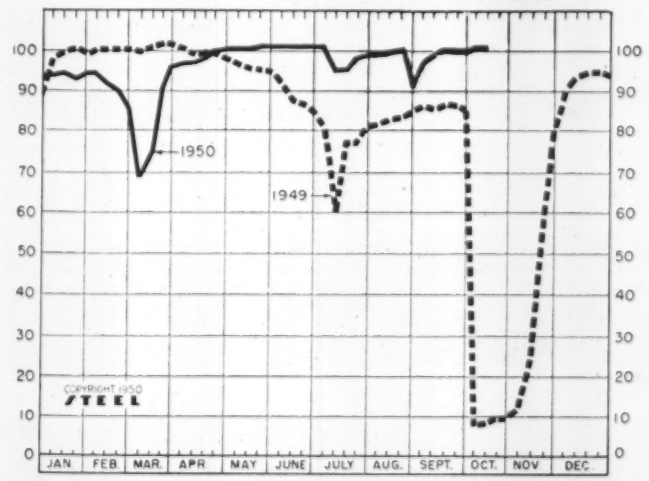
PRIORITIES—Sharp increase in DO ratings is likely this week. Military agencies are getting urgent requirements lined up. These priorities not only will come out in increasing number from arsenals and other government plants, but from general manufacturers on military equipment and components work as well. Many of these latter have been holding up inquiries pending issuance of priority authorizations. Also rated orders are expected covering military work placed prior to inauguration of regulation No. 2 which authorizes the DO ratings. Actually, a number of these preferences began to appear several weeks ago. Some came through without providing sufficient mill lead time, however, and probably will not be formally accepted until expected amendment of regulation No. 2 is acted on by NPA.

SUPPLIES—Extent to which priority tonnage will cut into supplies for the civilian market is not certain. However, it begins to look as though the impact of military demand will not be as severe as had been predicted in some circles. At any rate the NPA government allocation authority is expected to distribute military orders among the various steelmakers in such fashion that no one mill will be burdened to more than 25 per cent, at the outside, of its average monthly shipments of any specific product. This should mean the separate producer's steel supply for his regular customers to care for unrated requirements will continue substantial unless other government claimant agencies enter the picture with rated orders. Supplies will be increasingly tight, however. Currently, steel is pouring from the mills in record volume, but producers are steadily falling further behind on delivery promises. Heavy tonnage carryover into first quarter now seems certain.

DEMAND—Some easing in civilian goods demand may begin to be felt over coming weeks as result of government curbs on new house financing. Expectations are demand for major home appliances and light sheet metalwork will be adversely affected. Meanwhile, pressure for tonnage continues unabated with consumers turning increasingly to the conversion and gray markets for supplies to sustain operations. Tonnage available in these directions is limited. Converters are sold out for months ahead and relatively small tonnage is available in the gray market because of the close control on supplies being maintained by producing mills.

PRICES—Following the recent flurry of price changes, especially on galvanized wire products, the steel market last week settled down. No major changes now are expected until the pending wage question is nearer settlement. Price changes last week included increases on certain bolt and nut items, oven foundry coke, and some galvanized wire items. Reflecting the scattered advances, STEEL's weighted index on finished steel rose to 157.29 from 157.28. The arithmetical average advanced to $94.64 from $94.50. Composites held unchanged on pig iron with No. 2 foundry, $48.97, basic, $47.72, and malleable, $49.20. The scrap market held steady with the steelmaking grade composite unchanged at $41.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Oct. 14	Change	Same Week 1949	Same Week 1948
Pittsburgh	103	+ 1	3.5	96.5
Chicago	103.5	+ 1.5*	5	97.5
Eastern Pa.	99	0	8.5	94
Youngstown	106	0	0	104
Wheeling	98	— 1.5	59.5	90
Cleveland	98.5	0*	0	98.5
Buffalo	104	0	0	104
Birmingham	100	0	6	100
New England	82	0	52	87
Cincinnati	103	+ 4	46	103
St. Louis	94	0	89.5	89.5
Detroit	106	0	10	101
Western	103	0	21	..
Estimated national rate	101.5	0	8	98

Based on weekly steelmaking capacity of 1,906,267 net tons for first half and 1,926,803 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

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Composite Market Averages

	Oct. 12 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1936-39 av.=100)	157.29	157.28	156.99	152.52	101.87
Index in cents per lb.	4.261	4.261	4.253	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.64	$94.50	$94.50	$91.64	$58.27
No. 2 Fdry, Pig Iron, GT	48.97	48.97*	46.85	46.10	24.67
Basic Pig Iron, GT	47.72	47.72	45.97	45.60	24.00
Malleable Pig Iron, GT	49.20	49.20	47.49	47.27	25.29
Steelmaking Scrap, GT	41.00	41.00	41.08	26.75	19.17

* Revised.

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 12 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C.F., Pittsburgh	4.15	4.10–15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa.	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del.	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia	3.84	3.84	3.84	3.59	2.30
Sheets, H.R., Pittsburgh	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh	3.50	3.50	3.50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15–50	4.15–50	4.15–50	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh	4.50–75	4.50–75	4.50	4.15	2.75
Nails, Wire, Pittsburgh	5.30–60	5.30–60	5.30	5.15	2.90
Tin plate, box, Pittsburgh	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	52.70	36.00
Wire rods, 7/32-⅜", Pitts.	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47-$50	$47-$50	$47-$50	$47.00	$26.19
Basic, Valley	46-49	46-49	46.00	46.00	24.50
Basic, del. Phila.	50.39	50.39	50.39	49.44	26.34
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.69
No. 2 Fdry, Chicago	49.50	49.50	46.50	46.50	25.00
No. 2 Fdry, Valley	49.50	49.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila.	50.89	50.89	50.89	49.94	26.46
No. 2 Fdry, Birm.	45.88	45.88	42.38	39.38	21.38
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	49.08	45.43	25.06
Malleable, Valley	49.50	49.50	46.50	46.50	25.00
Malleable, Chicago	46.50-49.50	46.50-49.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn.	62.00	62.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$44.00	$29.75	$20.00
No. 1 Heavy Melt. E. Pa.	39.00	39.00	39.25	25.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	25.50	18.75
No. 1 Heavy Melt. Valley	43.75	43.75	43.75	31.25	20.00
No. 1 Heavy Melt. Cleve.	43.25	42.75	43.25	26.50	19.50
No. 1 Heavy Melt. Buffalo	41.50	41.50	41.50	28.25	19.25
Rails, Rerolling, Chicago	61.00	61.00	59.50	41.50	22.25
No. 1 Cast, Chicago	50.50	50.50	49.50	41.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl.	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl.	16.50	16.50	16.00	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	22.50-24.50	17.625	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.25	8.25
Lead, St. Louis	15.80	15.80	15.80	13.55	6.35
Tin, New York	112.00	106.00	103.50	96.00	52.00
Aluminum, del.	19.00	19.00	17.50	17.00	15.00
Antimony, Laredo, Tex.	32.00	32.00	32.00	32.00	14.50
Nickel, refinery, duty paid	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Brooklyn, N.Y., del.	....	52.79	53.29	....
Newark, del.	50.63	51.13	51.63	52.13
Philadelphia, del.	50.39	50.89	51.39	51.89
Birmingham District				
AlabamaCity, Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward, Ala. W15	45.38	45.88	....	....
Cincinnati, del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda, N.Y., W12	49.00	49.50	50.00	....
N. Tonawanda, N.Y., T9	....	49.50	50.00	....
Boston, del.	58.26	58.76	59.20	....
Rochester, N.Y., del.	51.63	52.13	52.63	....
Syracuse, N.Y., del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary, Ind. C3	46.00	....	46.50	....
IndianaHarbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14	49.00	49.50	49.50	....
So. Chicago, Ill. Y1	49.00	49.50	49.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	51.39	48.39	48.89
Muskegon, Mich., del.	....	54.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	49.50	....
Erie, Pa. I-3	49.00	49.50	49.50	50.00
Everett, Mass. E1	....	52.25	52.75	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
LosAngeles, SanFrancisco, del.	53.70	54.20	....	....
GraniteCity, Ill. M10	50.90	51.40	51.90	....
St. Louis, del. (inc. tax)	51.65	52.15	52.65	....
Ironton, Utah C11	46.00	46.50	....	....
LoneStar, Tex. L6	45.00	*45.50	45.50	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	49.50	49.50	50.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKeesRocks, del.	....	50.45	50.45	50.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	50.94	50.94	51.44
Verona, del.	....	51.40	51.40	51.90
Brackenridge, del.	....	51.63	51.63	52.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	....	....	49.50	50.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Swedeland, Pa. A3	50.00	50.50	51.00	51.50
Toledo, O. I-3	49.00	49.50	49.50	50.00
Cincinnati, del.	54.01	54.51	....	....
Troy, N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard, O. Y1	49.00	49.50	49.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield, O., del.	50.26	53.76	53.76	51.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SIVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$78.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	$2.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2	$6.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	$2.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Oct. 12, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 .....$50.00
Fontana,Calif. K1 ....76.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)
Detroit R7 .....$51.00
Fontana,Calif. K1 ....77.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ..51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ....$53.00
Clairton,Pa. C3 .....53.00
Conshohocken,Pa. A3 ..62.00
Ensley,Ala. T2 .....53.00
Fairfield,Ala. T2 .....53.00
Fontana,Calif. K1 ....72.00
Gary,Ind. C3 .....53.00
Johnstown,Pa. B2 ....53.00
Lackawanna,N.Y. B2..53.00
Munhall,Pa. C3 .....53.00
So.Chicago,Ill. C3 ...53.00
So.Duquesne,Pa. C3 ...53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 .....$63.00
Buffalo R2 .....63.00
Canton,O. R2 .....63.00
Clairton,Pa. C3 .....63.00
Cleveland R2 .....63.00
Conshohocken,Pa. A3...68.00
Detroit R7 .....66.00
Ensley,Ala. T2 .....63.00
Fairfield,Ala. T2 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Geneva,Utah G1 .....63.00
Houston,Tex. S5 .....71.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 .....63.00
Lackawanna,N.Y. B2...63.00
LosAngeles B3 .....82.00
Munhall,Pa. C3 .....63.00
Seattle B3 .....82.00
So.Chicago C3,R2,W14.63.00
So.Duquesne,Pa. C3 ..63.00
So.SanFrancisco B3 ...82.00

Alloy (NT)
Bethlehem,Pa. B2 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2, T7 .....66.00
Conshohocken,Pa. A3..70.00
Detroit R7 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. C3 .....66.00
Houston,Tex. S5 .....74.00
Ind.Harbor,Ind. Y1 ...66.00
Johnstown,Pa. B2 .....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....86.00
Massillon,O. R2 .....66.00
Midland,Pa. C18 .....66.00
Munhall,Pa. C3 .....66.00
Sharon,Pa. S3 .....66.00
So.Chicago C3,R2,W14.66.00
So.Duquesne,Pa. C3 ..66.00
Warren,O. C17 .....66.00
Youngstown Y1 .....66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Fontana,Calif. K1 ....100.00
Gary,Ind. C3 .....76.00
Ind.Harbor,Ind. I-2 ...76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00
So.Duquesne,Pa. C3 ...76.00

SHEETS BARS (NT)
Fontana,Calif. K1 ....$86.00

SKELP
Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.15
Warren,O. R2 .....3.15
Youngstown C3, R2 ....3.15

WIRE RODS
AlabamaCity,Ala. R2 ..3.85
Buffalo W12 .....3.85
Cleveland A7 .....3.85
Donora,Pa. A7 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 ....4.60
Houston,Tex. S5 .....4.25
Ind.Harbor,Ind. Y1 ...3.85
Johnstown,Pa. B2 ....3.85
Joliet,Ill. A7 .....3.85
LosAngeles B3 .....4.65
Minnequa,Colo. C10 ....4.10
Monessen,Pa. P7 .....4.05
No.Tonawanda,N.Y. B11.3.85
Pittsburg,Calif. C11 ...4.50
Portsmouth,O. P12 ....3.85
Roebling,N.J. R5 .....3.95
So.Chicago,Ill. R2 .....3.85
SparrowsPoint,Md. B2..3.95
Sterling,Ill.(1) N15 ....3.85
Struthers,O. Y1 .....3.85
Torrance,Calif. C11 ...4.65
Worcester A7 .....4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.40
Aliquippa,Pa. J5 .....3.40
Bessemer,Ala. T2 .....3.40
Bethlehem,Pa. B2 .....3.45
Clairton,Pa. C3 .....3.40
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 ....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2 ....3.40
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.00
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.00
Minnequa,Colo. C10 ...3.75
Munhall,Pa. C3 .....3.40
Niles,Calif.(22) P1 ....4.02
Phoenixville,Pa. P4 ...4.25
Portland,Oreg. O4 ....4.05
Seattle B3 .....4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B3 ....3.95
Torrance,Calif. C11 ....4.00
Weirton,W.Va. W6 ....3.40

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 ....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.15
Bessemer,Ala. T2 .....5.15
Bethlehem,Pa.(14) B2...5.20
Clairton,Pa. C3 .....5.15
Fairfield,Ala. T2 .....5.15
Fontana,Calif. K1 ....5.75
Gary,Ind. C3 .....5.15
Geneva,Utah G1 .....5.10
IndianaHarbor,Ind. Y1 .5.40
IndianaHarbor,Ind. Y1 .5.40
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y.(14)B2 5.20
LosAngeles B3 .....5.75
Munhall,Pa. C3 .....5.15
So.Chicago,Ill. C3 .....5.15
So.SanFrancisco B3 ....5.70
Struthers,O. Y1 .....5.40

Wide Flange
Bethlehem,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 ....3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
Munhall,Pa. C3 .....5.10
So.Chicago,Ill. C3 .....5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ..4.20
Munhall,Pa. C3 .....4.20
So.Chicago,Ill. C3 .....4.20
Weirton,W.Va. W6 ....4.20

BEARING PILES
Munhall,Pa. C3 .....3.40
So.Chicago,Ill C3 .....3.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.35
Bessemer,Ala. T2 .....5.35
Clairton,Pa. C3 .....5.35
Cleveland J5, R2 ....5.35
Conshohocken,Pa. A3 ..5.35
Ecorse,Mich. G5 .....5.60
Fairfield,Ala. T2 .....5.35
Fontana,Calif. K1 ....5.95
Gary,Ind. C3 .....5.35
Geneva,Utah G1 .....5.35
Ind.Harbor,Ind. I-2 ....5.35
IndianaHarbor,Ind. Y1 .5.60
Johnstown,Pa. B2 .....5.35
Munhall,Pa. C3 .....5.35
Pittsburgh J5 .....5.35
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. C3 .....5.35
SparrowsPoint,Md. B2..5.35
Warren,O. R2 .....5.35
Youngstown Y1 .....5.60

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.50
Coatesville,Pa. L7 ....4.80
Conshohocken,Pa. A3 ...4.55
Fontana,Calif. K1 ....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.75
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ..4.55
Harrisburg,Pa. C5 ....5.25
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 ....4.55

PLATES (Universal Mill)
Fontana,Calif. K1 ....4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.25

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.50
Aliquippa,Pa. J5 .....3.50
Ashland,Ky.(15) A10 ..3.50
Bessemer,Ala. T2 .....3.50
Clairton,Pa. C3 .....3.50
Claymont,Del. W16 ....3.90
Cleveland J5 R2 .....3.50
Coatesville,Pa. L7 ....3.90
Conshohocken,Pa. A3 ..3.75
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.50
GraniteCity,Ill. G4 .....4.20
Geneva,Utah G1 .....3.50
Harrisburg,Pa. C5 ....4.25
Houston,Tex. S5 .....3.90
Ind.Harbor,Ind. I-2, Y1..3.50
Johnstown,Pa. B2 .....3.50
Lackawanna,N.Y. B2 ..3.50
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.50
Pittsburgh J5 .....3.50
Seattle B3 .....4.40
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2 ..3.50
Steubenville,O. W10 ....3.50
Warren,O. R2 .....3.50
Weirton,W.Va. W6 ....3.50
Youngstown C3, R2, Y1.3.50

PLATES, Wrought Iron
Economy,Pa. B14 ....7.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.75
Ashland,lcl(15) A10 ...4.25
Cleveland,cl R2 .....4.10
Warren,O.cl R2 .....4.10

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.45
Aliquippa,Pa. J5 .....3.45
Alton,Ill(1) L1 .....3.45
Atlanta,Ga. A11 .....3.60
Bessemer,Ala. T2 .....3.45
Buffalo R2 .....3.45
Canton,O. R2 .....3.45
Clairton,Pa. C3 .....3.45
Cleveland R2 .....3.45
Ecorse,Mich. G5 .....3.65
Emeryville,Calif. J7 ....4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.17
N.Tonawanda,N.Y. B11.3.45
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 ....4.20
Seattle B3, N14 .....4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ....3.45
S.SanFran.,Cal. B3 ....4.20
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Weirton,W.Va. W6 ....3.45
Youngstown C3, R2 ....3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.45
Atlanta A11 .....3.60
Johnstown,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Niles,Calif. P1 .....4.17
Pittsburgh(23) J5 ....3.45
Portland,Oreg. O4 ....4.20
SanFrancisco S7 .....4.00
Weirton,W.Va. W6 ....3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2, T7 .....3.95
Clairton,Pa. C3 .....3.95
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....3.95
Houston,Tex. S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....5.00
Massillon,O. R2 .....3.95
Midland,Pa. C18 .....3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ....3.95
Struthers,O. Y1 .....3.95
Warren,O. C17 .....3.95
Youngstown C3 .....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.20
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....4.20
Youngstown C3 .....4.20

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Atlanta A11 .....5.35
Bessemer,Ala. T2 .....5.20
Bethlehem,Pa. B2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland R2 .....5.20
Ecorse,Mich. G5 .....5.40
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....6.25
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. I-2 ....5.20
IndianaHarbor,Ind. Y1 5.45
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
LosAngeles B3 .....5.90
Pittsburgh J5 .....5.20
So.Duquesne,Pa. C3 ....5.20
So.SanFrancisco B3 ...5.95
Str thers,O. Y1 .....5.45
Youngstown C3 .....5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.15
Ambridge,Pa. W18 .....4.15
BeaverFalls,Pa. M12,R2.4.15
Buffalo B5 .....4.15
Camden,N.J. P13 .....4.60
Carnegie,Pa. C12 .....4.15
Chicago W18 .....4.15
Cleveland A7, C20 ....4.15
Detroit P17 .....4.30
Donora,Pa. A7 .....4.15
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.15
FranklinPark,Ill. N5 ...4.15
Gary,Ind. R2 .....4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 ....4.55
Harvey,Ill. B5 .....4.15
LosAngeles R2 .....5.55
Mansfield,Mass. B5 ....4.55
Massillon,O. R2, R8 ...4.15
Midland,Pa. C18 .....4.15
Monaca,Pa. S17 .....4.15
Newark,N.J. W18 .....4.55
Plymouth,Mich. P5 ....4.40
Pittsburgh J5 .....4.15
Putnam,Conn. W18 ....4.55
Readville,Mass. C14 ...4.55
St.Louis,Mo. M5 .....4.55
So.Chicago,Ill. W14 ....4.15
SpringCity,Pa.(5) K3 ..4.55
Struthers,O. Y1 .....4.15
Waukegan,Ill. A7 .....4.15
Youngstown F3, Y1 ....4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.90
Ambridge,Pa. W18 .....4.90
BeaverFalls,Pa. M12 ...4.90
Bethlehem,Pa. B2 .....4.90
Buffalo B5 .....4.90
Canton,O. R2, T7 .....4.90
Carnegie,Pa. C12 .....4.90
Chicago W18 .....4.90
Cleveland A7, C20 ....4.90
Detroit P17 .....5.05
Donora,Pa. A7 .....4.90
Elyria,O. W8 .....4.90
Gary,Ind. R2 .....4.90
Hammond,Ind. L2, M13.4.90
Hartford,Conn. R2 ....5.20
Harvey,Ill. B5 .....4.90
Lackawanna,N.Y. B2 ..4.90
Mansfield,Mass. B5 ....5.20
Massillon,O. R2, R8 ...4.90
Midland, Pa. C18 .....4.90
Monaca,Pa. S17 .....4.90
Newark,N.J. W18 .....5.20
Plymouth,Mich. P5 ....5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 .....4.90
Warren,O. C17 .....4.90
Waukegan,Ill. A7 .....4.90
Worcester,Mass. A7 ....5.20
Youngstown F3, Y1 ....4.90

RAIL STEEL BARS
ChicagoHts.(3)I-2, C2 ..4.00
ChicagoHts.(4) I-2 ....3.45
Dallas,Tex.(4) S20 ....6.00
Franklin,Pa.(3) F5 .....4.00
FortWorth,Tex.(26) T4..4.63
Huntngtn,W.Va.(3) W7.4.00
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....3.55
Williamsport(3) S19 ...4.25

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
McK.Rks.(S.R.) L5 ...8.60
McK.Rks.(D.R.) L5 ...11.25

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.45
Alton,Ill(6) L1 .....3.45
Atlanta A11 .....3.60
Buffalo R2 .....3.45
Cleveland R2 .....3.45
Emeryville,Calif. J7 ..4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.17
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
SandSprings,Okla S5 ..4.35
Seattle B3, N14 .....4.20
So.Chicago,Ill. R2 .....3.45
So.Duquesne,Pa. C3 ....3.45
So.SanFrancisco B3 ....4.20
SparrowsPoint,Md. B2 ..3.45
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Youngstown C3, R2 ....3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .4.50
Johnstown, ¼-1" B2 ...4.35
LosAngeles B3 .....5.00
Marion,O. P11 .....4.75
Seattle B3, N14 .....5.10
So.SanFrancisco B3 ....5.00
SparrowsPt., ¼-1" B2 .4.35
Williamsport,Pa. S19 ..4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.35
Ashland,Ky.(8) A10 ...3.35
Butler,Pa. A10 .....3.35
Cleveland J5, R2 .....3.35
Conshohocken,Pa. A3 ..3.60
Detroit M1 .....4.15
Ecorse,Mich.(8) G5 ....3.55
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 ....4.25
Gary,Ind. C3 .....3.35
GraniteCity,Ill. G4 .....4.05
Geneva,Utah G1 .....3.45
Ind.Harbor,Ind. I-2, Y1..3.35
Irvin,Pa. C3 .....3.35
Lackawnna,N.Y. B2 ...3.35
Munhall,Pa. C3 .....3.35
Niles,O. N12 .....4.50
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. W14 ....3.35
SparrowsPoint,Md. B2 .3.35
Steubenville,O. W10 ....3.35
Torrance,Calif. C11 ....4.05
Warren,O. R2 .....3.35
Weirton,W.Va. W6 ....3.35
Youngstown C3, Y1 ....3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 .....4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 .....4.15
Niles,O. N12 .....5.00
Torrance,Calif. C11 ....5.15

SHEETS, H-R (14 ga., heavier) High-strength Low-Alloy
Cleveland J5, R2 .....5.05
Conshohocken,Pa. A3 ..5.05
Ecorse,Mich. G5 .....5.50
Fairfield,Ala. T2 .....5.05
Fontana,Calif. K1 .....6.00
Gary,Ind. C3 .....5.05
Ind.Harbor,Ind. I-2 ....5.05
IndianaHarbor,Ind. Y1 5.30
Irvin,Pa. C3 .....5.05
Lackawanna(35) B2 ..5.05
Pittsburgh J5 .....5.05
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. C3 .....5.05
SparrowsPoint(36) B2 ..5.05
Warren,O. R2 .....5.05
Weirton,W.Va. W6 ....5.05
Youngstown, C3 .....5.05
Youngstown Y1 .....5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.20
Ecorse,Mich. G5 .....6.65
Fontana,Calif. K1 ....7.05
Gary,Ind. C3 .....6.20
Ind.Harbor,Ind. I-2 ....6.20
IndianaHarbor,Ind. Y1 6.45
Irvin,Pa. C3 .....6.20
Lackawanna(37) B2 ...6.20
Pittsburgh J5 .....6.20
SparrowsPoint(38) B2..6.20
Warren,O. R2 .....6.20
Weirton,W.Va. W6 ....6.20
Youngstown Y1 .....6.45

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.80
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo, Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	5.50
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	6.05

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	5.30
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23)F4	5.70

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor 1-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron	An'l	Galv.
Apollo,Pa. B14	*12.60*	*16.85*

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10(cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill.G4(cut lengths)	...	...	7.40	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.50	7.00	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.75
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	5.90
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y-1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	5.30
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.45
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston, Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.75
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Fontana,Calif. K1	11.15
Harrison,N.J. C18	9.50
NewBritn.Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	10.10
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61 0.80C	0.81-1.00C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.50	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.50	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	...
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8:					
Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.85	6.30	6.90	8.85	11.15
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	5.60
Bridgeprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.85
Fontana,Calif. K1	4.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	4.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
New York W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.85
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Dover,O. G6	4.50
Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A.M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Beardale,Ill. A1	3.40
Sharon,Pa. S3	3.90
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill. (1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
Los Angeles B3	6.85
Millbury,Mass.(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. MS	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P16	5.35
Monessen,Pa. P7	5.60
Pawtucket,R.I.(12) NS	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. MS	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P16	8.05	8.05	8.30
Monessen,Pa. P7	8.30	8.30	8.55
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. MS	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O. (24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
Los Angeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.75
Newark, 6-8ga. I-1	5.15
No. Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.80
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. MS	*5.45*	*5.95*
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.60	5.85
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.85
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.50
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. MS	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	130
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville MS	*135*
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	133
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	133

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	125
Duluth A7	116
Franklin,Pa. F5	125
Huntington,W.Va. W7	*125*
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	125
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	130

WOVEN FENCE, 9-15½ Ga.

	Col.
AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	120
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. MS	*128*
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	123
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville MS	*120*
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	4.00

NAILS & STAPLES, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	110
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. MS	112
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity, Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	112
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	111
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. MS	*5.90*
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelson Steel & Wire Co.
N6 New Eng. HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pits.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Senaca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield,S.&.I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn.Coal, Iron & R.R.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel &Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18,25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20,25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V, 6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 14 gage.
(24) Deduct 0.35c for finer than 15 gage.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (8" bar elec. furn. billet, 5.05c); to coilstumers, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 4.75c. 0.025" and heavier.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.0	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N.3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 2½ pts. lower on ⅛", 1½ pts lower on ⅜" and 3½ pts lower on ½" through 3"; Butler, Pa. ⅛" through ⅜" F6; Benwood, W. Va. W10 except 3½ pts lower on ⅛", 2½ pts lower on ¼", 3 pts lower on ⅜", 2½ lower on ½", 3½ lower on ¾, 1¼, 1½ and 2", 3 lower on 2½ and 3", and 4 lower on 1" Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5 and Etna, Pa. N2 quote 2½ pts lower on ½", 3½ lower on ¾", 1¼", 1½", and 2", 3 lower on 2½" and 3", and 4 lower on 1". Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 2½ points lower; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Copper Base Both Sides
Stainless 302	....	....	....	....	19.75	21.50–24.00	75.00
304	23.50	26.50–28.00	....	....	20.75–23.50	22.50–25.5	77.00
305	....	....	....	....	....	....	79.00
309	29.00	33.50	....	....	....	....	....
310	35.00	39.50	....	....	....	....	105.00
316	28.00	31.00–32.50	....	....	26.00	28.00–34.5	....
317	33.00	37.50	....	....	....	....	....
318	32.00	36.50	....	....	....	....	....
321	25.00	29.50	....	....	23.00	25.00	90.00
347	26.00	29.00–30.50	....	....	24.00	26.00–31.5	94.00
405	19.75	26.25	....	....	....	....	....
410	19.25	25.75	....	....	....	....	....
430	19.25	25.75	....	....	....	....	....
Nickel	31.00	41.00	33.50	45.00	....	....	88.00
Inconel	39.00	51.00	....	....	....	....	140.00
Monel	32.00	42.00	....	....	....	....	83.00
Copper*	....	....	21.45†	27.15†	....	....	....

* Deoxidized. † 17.95c for hot-rolled. ‡23.90c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 23
- ⅝-in & ⅝-in. 26
- ¾-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	23	23
⅝-in. & ⅝-in..	20	15
¾-in.-1½-in. ..	23	10
1⅝ in. & larger	16	10
H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅝-in..	24	15
¾-in.-1½-in. ..	20	11
1⅝ in. & larger	17	11
C.P. Hex:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	30	25
¾-in. & 1½-in.	27	20
1⅝ in. & larger	20	15

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.
½-in. & smaller ..	35	41
⅝-in. & ⅝-in. ...	29	36
¾-in.-1½-in.	23	31
1⅝-in. & larger ..	17	21
Light		
⅞-in. & smaller		41
½-in. to ⅝-in.		35
¾-in. to 1½-in.		33

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....56 & 10
Plated finishes .....41 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 47
- ¾-in. through 1 in. ... 40

Longer than 6 in.:
- ⅝-in. & smaller 33
- ¾-in. through 1 in. ... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 44
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger 24
N.F. thread, all diams... 18

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
⅞-in., under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5½	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	39.00	32.00	30.00
302...	39.00	34.50	30.00
303...	41.00	38.00	32.50
304...	41.00	36.50	31.50
309...	53.50	52.50	43.00
316...	54.50	56.50	47.50
321...	47.00	46.00	35.50
347...	51.50	50.00	40.00
410...	34.50	28.50	24.50
416...	35.00	35.00	25.00
420...	42.00	45.00	30.00
430...	37.00	29.00	25.00
501...	25.50	24.00	13.00
502...	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.
Baltimore, bars, wire and structurals A10.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416, S18.
Cleveland, strip A7.
Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars C3.
Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Harrison, N. J., Types 302, 304, 316 wire and strip D6.
Massillon, all products R2.
McKeesport, Pa., bars; sheets except Type 416 C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip C4.
So. Chicago, Ill., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & Wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-32.00
Toluol, one deg...21.00-28.00
Industrial xylol ..21.00-29.50
Per ton bulk, ovens
Sulphate of ammonia .$32-45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38.
Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge Iron: Cents
- 98+% Fe, carlots.. 15.00
- Swedish, c.i.f. New York, in bags....7.40-8.50

Electrolytic Iron:
- Annealed, 99.5% Fe 39.50
- Unannealed, 99+% Fe 33.50
- Unannealed 99+% Fe(minus 325 mesh)48.50

Powder Flakes 44.50
Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns..70.00-135.00

Aluminum:
- Carlots, freight allowed 27.00
- Atomized, 500 lb drums, freight allowed 30.00

Brass, 10-ton lots..28.50-31.25
Copper:
- Electrolytic 33.75
- Reduced 33.50

Lead 20.50
Manganese:
- Minus 100-mesh 52.00
- Minus 35 mesh 48.00
- Minus 200 mesh.... 56.00

Nickel unannealed ... 75.50
Nickel-Silver, 10-ton lots 41.75
Silicon 34.00
Solder (plus cost of metal) 8.50
Stainless Steel, 302 ... 75.00
Tin $1.20
Zinc, 10-ton lots..20.50-28.00
Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed:
  - over 1000 lb 2.90
  - 1000 lb 2.95
  - less than 1000 lb.. 3.00
- 98.8% minus 65 mesh, freight allowed:
  - 1000 lb and over... 2.90
  - less than 1000 lb.. 3.00

Molybdenum:
- 99%, minus 80 to 200 mesh, over 500 lb 2.25
- 200 to 500 lb 2.60
- less than 200 lb .. 2.75
- 82-88%, freight allowed, 2000 lb and over .. 2.40
- less than 2000 lb.. 2.45

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur. .$14.00-14.50
Connelsvll.fdry. .16.00-17.00
New River, foundry ...19.00
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens $22.75
Everett, Mass., ovens
- New England, del...‡23.40

Chicago, ovens 21.00
- Chicago del. .....‡22.45
- Detroit, del. 24.91

Terre Haute, ovens 22.50
Milwaukee, ovens 23.00
Indianapolis, ovens 22.00
- *Chicago, del. 25.37*
- *Cincinnati, del. 24.92*
- *Detroit, del. 25.90*

Ironton, O., ovens 20.40
- Cincinnati, del. 22.71

Painesville, O., ovens 23.25
- *Buffalo, del. 25.37*
- *Cleveland, del. 24.97*

Erie, Pa., ovens 22.50
Birmingham, ovens ...19.15
- Birmingham, del. ...20.20

Philadelphia, ovens 22.10
Neville Island, Pa., ovens 22.00
Swedeland, Pa., ovens 22.00
St. Louis, ovens 22.99
- St. Louis, del. 24.12

Portsmouth, O., ovens..20.15
- Cincinnati, del. 22.71

Detroit, ovens 23.00
- Detroit, del. *22.65
- Buffalo, del. 24.69
- Flint, del. 24.09
- Pontiac, del. 23.04
- Saginaw, del. 24.40

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York(c'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city) ..	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.58	7.48
Boston (c'try) .	5.75	6.55	7.69	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city) ..	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try) ..	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash. (w'hse) .	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††[3]	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††[3]	5.35	5.65	6.95
Pitts. (w'hse)..	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††[3]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city) ..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75††[3]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.95	5.10	...	5.10	5.65	9.55††[3]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.29	5.44	...	5.44	6.09	9.89††[3]	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69††[3]	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††[3]	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††[3]	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[2]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[2]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.70	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[9]	7.60[3]	7.50[3]	7.45[3]	8.25[3]	6.30[3]	7.55	...	6.30[3]	6.40[3]	8.50[3]
Seattle-Tacoma .	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [2]—450 to 1499 lb; [9]—1000 to 1999 lb; [7]—300 to 999 lb; [8]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., $60; Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, New Cumberland, W. Va., $58; Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $73; chemical-bonded chrome brick, $77; magnesite brick, $99; chemical-bonded magnesite, $88.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; bulk, $36.30; single paper bags, $41.80.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces, $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 213)

Tin Prices Soar to All-Time High

Advances in Straits spot to $1.12 and in zinc on the Commodity Exchange to 27.50c for October delivery may force government to impose restrictions. Zinc producers' prices hold

New York—Imposition of government price controls over tin and zinc appeared more threatening last week. Tin prices soared to an all-time high of $1.12 for Straits spot while zinc sold on the Commodity Exchange for October delivery at 27.50c. The price for prime western on the producers market held unchanged, however, at 17.50c, E. St. Louis.

The record high price for tin is due largely to heavy shipments of Straits tin to Europe where prices are higher than here. Shipments to Europe have been running three times as large as normal. All interests in the world tin market are deeply concerned over the instability of the market, a subject which will be discussed at a meeting to be held in Geneva, Switzerland, starting Oct. 25. An international tin control agreement may be written at that meeting.

Although consumption of tin in this country is at a high level, users are reluctant to enter the market, bulk of the business being transacted by professional traders. Consumption in this country is estimated at 7000 tons per month during the third quarter compared with an average of 6000 tons in the second quarter.

Zinc — Suspension of trading in zinc futures on the Exchange is advocated by some market interests. This action was taken in 1942 when similar conditions prevalied. Supplies of zinc available to consumers are far below needs. Stocks of slab zinc held by United States smelters at the end of September were the lowest in almost 25 years, amounting to only 10,267 tons against 14,451 tons at the end of August. Tonnages going to galvanizers, die casters and other industrial users have been augmented by those moving into the government's stockpile. Shipments in September totaled 75,241 tons compared with 79,365 tons in August, while production amounted to 71,057 tons against 73,399 tons. Unfilled orders at the end of September totaled 69,062 tons compared with 76,847 tons at the end of August.

Copper—Sellers are making commitments cautiously in the copper market, conserving their holdings for the expected flood of DO orders. The primary copper market held unchanged, but secondary ingot and scrap prices advanced. Manufacturers of brass and bronze ingots raised prices 1½ cents to 2 cents a pound. As high as 30.00c a pound was paid for No. 1 copper scrap. Release of 5000 tons of copper and brass scrap from bond by removal of duty is not enough to satisfy demand for prompt delivery.

Lead—Compared with other major metal markets, pressure for coverage in lead is light. Sellers are booking a satisfactory volume of business, however, on the basis of 15.80c, St. Louis, and 16.00c, New York. Sales in September were the second largest for any month this year and current business is maintaining that rate. Some sellers are drawing on reserves to meet fresh demands.

Aluminum—In addition to raising prices 1½ cents per pound on aluminum pig and ingots, effective Sept. 29, Reynolds Metals Co. on Oct. 4 advanced prices on plate, sheet, coiled sheet and circles. Higher prices are effective on Oct. 4 on new business, but on previously accepted commitments the new prices are applicable on shipmnets starting Oct. 20.

Company advanced prices, effective Oct. 9 on new business, on drawn and extruded tubing, irrigation pipe, tube bloom, standard shapes, warehouse architectural tubing, and extruded aluminum pipe. The higher prices on previous order commitments are effective Oct. 25, with the exception of tube bloom which are effective on shipments Oct. 30.

Prices on extruded shapes in both 3S and 63S remain unchanged, but other extruded shapes and extruded alloys have been revised upward.

Company's price advances on fabricated products is said to average 11.5 per cent.

Aluminum Extruded Products

New York—A new manual of drafting standards for aluminum extrusions has been issued by the Extruded Products Division, Aluminum Association, this city. Purpose of the manual is "to outline certain basic practices that are necessary to extruded products and, for the first time, to standardize those practices as far as at this time seems practical."

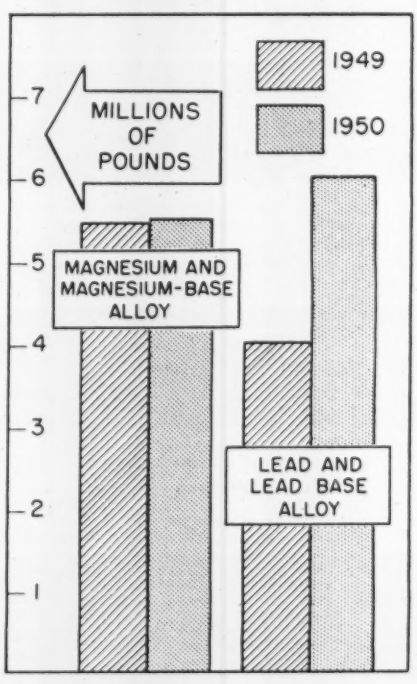
Production of aluminum extrusions increased tremendously during World War II and these products have proved useful in an increasing variety of applications since the war. Extrusion section drawings are being constantly exchanged between users and producers of these products and therefore the preparation of drawings in conformity with the standards should be beneficial to both.

Basic methods of dimensioning, for example, are important to the producer to enable him to maintain reasonable efficiency in the manufacture of extrusion tools and in the inspection of extruded material. Adoption of these dimensioning methods by the user will help insure his obtaining a suitable and economical product.

Castings Shipments Rise

. . . demand gains momentum

(Indicated totals are for seven months)



Exports of Metals Restricted

Washington — Commerce Department has placed additional destination controls on exports of several nonferrous metals and manufactures. As a result, validated licenses are required for exports of these commodities to all destinations except Canada. Commodities covered include: Aluminum ores and concentrates; aluminum and aluminum base alloys; copper and manufactures; brass and bronze manufactures; lead and manufactures; zinc and manufactures.

No more than 7000 tons of aluminum and products may be shipped nor more than 6500 tons of zinc and its products in the final quarter. Dates for submission of applications for fourth quarter licenses are Oct. 9 to 20, inclusive. Applications must include evidence of availability of the particular commodity, a certificate of accepted order, and a detailed statement of end use of the commodity.

Kaiser To Expand Mead Plant

Spokane, Wash.—Kaiser Aluminum & Chemical Corp., Oakland, Calif., has awarded a $3.7 million building contract at the Mead reduction plant to Kaiser Engineers Inc. This is in addition to the recently announced $2 million expansion in connection with addition of a seventh potline. The new project involves nine steel frame structures including rectifier, potline, pattern, storage, carbon baking furnace, carbon pressing buildings, also oil and aluminum storage tanks.

Titanium Plant Being Expanded

National Lead Co.'s titanium plant at Sayreville, N. J., will be substantially enlarged by new construction starting immediately. The new buildings and equipment are scheduled for completion in 15 months.

This further expansion of facilities, the company said, is intended to meet the steadily increasing demand for titanium oxide pigments for the current industrial mobilization program.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingot: 85-5-5-5 (No. 115) 27.00c; 88-10-2 (No. 215) 39.00c; 80-10-10 (No. 305) 31.00c; No. 1 yellow (No. 405) 23.75c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 27.25-28.00c; No. 12 foundry alloy (No. 2 grade) 26.75-27.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 28.00-28.50c; grade 2 27.00-27.50c; grade 3, 26.50-27.00c; grade 4, 26.00-26.50c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot 112.00c, prompt 111.75c, late Oct. 111.50c, Nov. 111.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 34.00c; English, 32.75c; Belgian, 32.75c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $90-$95 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Cleveland and Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.40 del.; special or patented shapes $2.65.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $100-103 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $220 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 40.93; yellow brass 37.53; commercial bronze, 95%, 40.86; 90%, 40.38; red brass, 85% 39.39; 80% 38.92; best quality, 38.40; nickel silver, 18%, 51.16; phosphor-bronze, grade A, 5% 59.45.

Rods: Copper, hot-rolled 36.78; cold-drawn 38.03; yellow brass free cutting, 31.88; commercial bronze, 95% 40.55; 90% 40.07; red brass 85% 39.08; 80% 38.61.

Seamless Tubing: Copper 40.97; yellow brass 40.54; commercial bronze 90% 43.04; red brass 85% 42.30; 80% 41.83.

Wire: Yellow brass 37.82; commercial bronze, 95% 39.72; 90% 40.67; red brass, 85% 39.68; 80% 39.21; best quality brass 38.69.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67, l.c.l. 29.17, 100,000 lb lots 28.545; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— R317-T4	17S-T4
0.125	52.0	....	....	
0.156-0.188	44.0	....	....	
0.219-0.313	41.5	....	....	
0.375	40.0	46.0	48.0	
0.406	40.0	....	....	
0.438	40.0	46.0	48.0	
0.469	40.0	....	....	
0.500	40.0	46.0	48.0	
0.531	40.0	....	....	
0.563	40.0	....	45.0	
0.594	40.0	....	....	
0.625	40.0	43.5	45.0	
0.688	40.0	....	45.0	
0.750-1.000	39.0	41.0	42.5	
1.063	39.0	....	41.0	
1.125-1.500	37.5	39.5	41.0	
1.563	37.0	....	....	
1.625	36.5	....	39.5	
1.688-2.000	36.5	....	....	

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $21.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils $21.00 per cwt. Traps and bends: List prices plus 60%

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 21.50-22.00c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 37.59c; oval 37.09c; cast 35.62c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl, 31.50c up to 10,000 lb, 31.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.875
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; composition red brass 19.00; radiators 15.50; heavy yellow brass 14.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; refinery brass (60% copper) per dry copper content 20.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 21.00-21.50; No. 2 19.50-20.00; light copper 18.50-19.00; No. 1 composition red brass 16.75-17.00; No. 1 composition turnings 16.25-16.50; mixed brass turnings 11.00-11.50; new brass clippings 17.00-17.50; No. 1 brass rod turnings 15.50-16.00; light brass 10.50-10.75; heavy yellow brass 13.00; new brass rod ends 16.00-16.50; auto radiators, unsweated 13.75-14.00; cocks and faucets, 15.75-16.00; brass pipe 15.75-16.00.

Lead: Heavy 13.25-13.50; battery plates 8.25-8.50; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 60.00-62.00; blocktin pipe 80.00-85.00; No. 1 babbitt 55.00-57.00.

Aluminum: Clippings 2S 15.00; old sheets 13.00; crankcase 13.00; borings and turnings 12.00.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 11	24.50	15.80	17.50	112.00	19.00	32.00	48.00	72.75
Oct. 10	24.50	15.80	17.50	111.50	19.00	32.00	48.00	72.75
Oct. 9	24.50	15.80	17.50	109.25	19.00	32.00	48.00	72.75
Oct. 6-7	24.50	15.80	17.50	107.50	19.00	32.00	48.00	72.75
Oct. 4-5	24.50	15.80	17.50	106.00	19.00	32.00	48.00	72.75
Oct. 3	24.50	15.80	17.50	105.75	19.00	32.00	48.00	72.75
Oct. 2	24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75
Sept. Avg.	23.50	15.60	17.10	101.25	17.68	31.02	48.00	72.75
Sept. 28-30	22.50-24.50	15.80	17.50	102.50	17.50-19.00	32.00	48.00	72.75
Sept. 27	22.50-24.50	15.80	17.50	103.50	17.50-19.00	32.00	48.00	72.75
Sept. 25-26	22.50-24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75
Sept. 22-23	22.50-24.50	15.80	17.50	103.50	17.50	32.00	48.00	72.75
Sept. 21	22.50-24.50	15.80	17.50	103.00	17.50	32.00	48.00	72.75
Sept. 20	22.50-24.50	15.80	17.50	102.50	17.50	32.00	48.00	72.75
Sept. 18-19	22.50-24.50	15.80	17.50	101.00	17.50	32.00	48.00	72.75
Sept. 14-16	22.50-24.50	15.80	17.50	103.00	17.50	32.00	48.00	72.75
Sept. 13	22.50-24.50	15.80	17.50	102.00	17.50	32.00	48.00	72.75
Sept. 12	22.50-24.50	15.80	17.50	101.25	17.50	32.00	48.00	72.75
Sept. 11	22.50-24.50	15.80	17.50	100.50	17.50	32.00	48.00	72.75
Sept. 8-9	22.50-24.50	15.80	17.50	99.00	17.50	28.50	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Oct. 12, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 12	$41.00
Oct. 5	41.00
Sept. 1950	40.93
Oct. 1949	26.71
Oct. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	44.00-46.00
No. 2 Bundles	39.00
Heavy Turnings	43.00-44.00
Machine Shop Turnings	*35.00-36.00†*
Mixed Borings, Turnings	*35.00-36.00†*
Short Shovel Turnings.	38.00
Cast Iron Borings	*36.00-37.00*
Low Phos. Steel	49.00-50.00

Cast Iron Grades

No. 1 Cupola Cast	47.50-48.50
No. 1 Machinery Cast.	52.00-53.00
Charging Box Cast	*45.00-46.00*
Heavy Breakable Cast	*44.00-45.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	*57.00-58.00**
Rails, 2 ft. and under	*62.00-64.00*
Rails, 18 in. and under	*63.00-65.00*
Railroad Specialties	56.00-57.00

† Crushers' buying prices.
* Nominal.

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	*$43.50*
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Busheling	42.50-43.00
No. 1 Bundles	42.50-43.00
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.50-37.00
Low Phos.	46.00-46.50

Cast Iron Grades

No. 1 Cupola	*62.00-63.00*
Charging Box Cast	*49.00-50.00*
Stove Plate	*46.00-47.00*
Heavy Breakable Cast	*49.00-50.00*
Unstripped Motor Blocks	*39.00-40.00*
Brake Shoes	*46.00-47.00*
Clean Auto Cast	*62.00-63.00*
No. 1 Wheels	*52.00-53.00*
Burnt Cast	*43.00-44.00*

Railroad Scrap

No. 1 R.R. Heavy Melt	*44.00*
R.R. Malleable	*64.00-65.00*
Rails, 3 ft and under	*64.00-65.00*
Rails, 18 in. and under	*65.00-66.00*
Rails, Random Lengths	*60.00-61.00*
Cast Steel	*51.00-52.00*
Railroad Specialties	*53.00-54.00*
Uncut Tires	*58.00-59.00*
Angles, Splice Bars	*61.00-62.00*

VALLEY

No. 1 Heavy Melt. Steel	$43.50-44.00
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Bundles	43.50-44.00
Facty. Prod. Bundles.	43.50-44.00
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	35.00-35.50
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Low Phos.	46.00-46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	38.00
No. 1 Bundles	39.00
No. 2 Bundles	32.00
Short Shovel Turnings.	33.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	*26.00-27.00*
Low Phos. Punchings and Plate, elec. fur. grade	47.00
Low Phos. Plate, 5 ft & Under	47.00
Elec. Furnace Bundles.	44.00
Heavy Turnings	39.00
No. 1 Chemical Borings	*40.00*
Knuckles and couplers.	48.00
Steel car wheels	48.00

Cast Iron Grades

No. 1 Cupola Cast	*48.00-49.00*
No. 1 Machinery Cast	*50.00-51.00*
No. 1 Yard Cast	*45.00-46.00*
Charging Box Cast	*46.00-47.00*
Heavy Breakable Cast	*46.00-47.00*
No. 1 Wheels	*54.00-55.00*
Malleable	*60.00*

CINCINNATI

No. 1 Heavy Melt. Steel	*$42.00*
No. 2 Heavy Melt. Steel	*37.00*
No. 1 Busheling	*42.00*
No. 1 Bundles	*42.00*
No. 1 Black Bundles	*37.00*
No. 3 Bundles	28.00
Machine Shop Turnings	27.00
Short Shovel Turnings.	30.00
Mixed Borings, Turnings	29.00
Cast Iron Borings.	30.00

Cast Iron Grades

No. 1 Cupola Cast	*57.50*
Charging Box Cast	48.00
Stove Plate	*42.00*
Heavy Breakable Cast.	47.00
Unstripped Motor Blocks	*36.00*
Brake Shoes	33.00
Clean Auto Cast	*57.50*
Drop Broken Cast	*60.00*
Low Phos., 18 in. and under	*55.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*43.00*
R.R. Malleable	*57.00*
Rails, Rerolling	*58.00*
Rails, Random Lengths	*58.00*
Rails, 18 in. and under	*65.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$30.00-31.00
No. 1 Bundles	37.00-37.50
No. 2 Bundles	29.00-30.00
No. 1 Busheling	37.00-37.50
Machine Shop Turnings	25.00-25.50
Forge Flashings	37.00-37.50
Short Shovel Turnings	27.00-27.50
Cast Iron Borings	27.00-27.50
Punchings & Plate Scrap	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-43.00
Heavy Breakable Cast	35.00-36.00
Clean Auto Cast	45.00-46.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Cast Iron Borings	31.50-32.00
Short Shovelings	33.50-34.00
Low Phos.	42.00-43.00

Cast Iron Grades

No. 1 Cupola	44.00-45.00
No. 1 Machinery	48.00-50.00
Malleable	49.00-50.00

Railroad Scrap

Rails, 2 ft. and under	49.00-50.00
Rails, random size	44.00-45.00
Railroad Specialties	42.00-43.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50
No. 2 Bundles	*28.00-28.50*
Machine Shop Turnings	*24.50-25.00*
Mixed Borings, Turnings	*24.50-25.00*
Short Shovel Turnings	*25.50-26.00*
Punchings & Plate Scrap	36.00-37.00
Low Phos. Plate, 5 ft & under	36.00-37.00
Elec. Furnace Bundles.	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*36.00-37.00*
No. 1 Machinery	*38.00-39.00*
Charging Box Cast	*36.00-37.00*
Heavy Breakable	*36.00-37.00*
Unstripped Motor Blocks	*30.00-30.50*

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$32.00
No. 2 Heavy Melt. Steel	*28.50-29.00*
No. 1 Bundles	32.00
No. 1 Busheling	*31.50-32.00*
Machine Shop Turnings	*23.50-24.50*
Short Shovel Turnings	*25.00-26.00*
Mixed Borings, Turnings	25.00-25.50
Bar Crops and Plate	40.00-42.00
Punchings & Plate Scrap	40.00-42.00
Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	*34.50-35.50*
Mixed Cast	*33.50-34.50*
Heavy Breakable Cast	*31.00-33.00*
Stove Plate	*32.50-33.00*

CHICAGO

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Bundles	40.00
No. 2 Bundles	*35.00*
Machine Shop Turnings.	31.00-32.00
Mixed Borings, Turnings	33.00-34.00
Short Shovel Turnings.	33.00-34.00
Cast Iron Borings	33.00-34.00
Low Phos.	*51.50-52.50*
Elec. Furnace Bundles.	40.00-41.00
Heavy Turnings	37.00-38.00
Cut Structurals	44.00-45.00

Cast Iron Grades

No. 1 Cupola Cast	*53.00-54.00*
Clean Auto Cast	*54.00-56.00*
No. 1 Wheels	*41.00-42.00*
Stove Plate	*43.50-44.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*45.00-46.00*
Malleable	*59.00-60.00*
Rails, Rerolling	*64.00-65.00*
Rails, Random Lengths	*56.00-57.00*
Rails, 2 ft. and under	*61.00-62.00*
Rails, 18 in. and under	*62.00-63.00*
Railroad Specialties	*54.00-55.00*
Angles, Splice Bars	53.00-54.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	*$38.00-40.00*
No. 2 Heavy Melt. Steel	*34.00-35.00*
No. 1 Busheling	*36.00*
No. 2 Bundles	*35.50*
Machine Shop Turnings	*30.00*
Mixed Borings, Turnings	*28.00*
Short Shovel Turnings	*34.00*
Cast Iron Borings	*28.00*
Bar Crops and Plate	*44.00-45.00*
Cut Structurals	*44.00*

Cast Iron Grades

No. 1 Cupola Cast	*54.00*
Stove Plate	*47.00-48.00*
No. 1 Wheels	*nominal*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	nominal
Rails, Rerolling	*55.00*
Rails, 3 ft and under	*52.00*
Angles and Splice Bars	*50.00*

ST. LOUIS

No. 1 Heavy Melt. Steel	*$39.50-40.50*
No. 2 Heavy Melt. Steel	36.00-37.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	*35.00-36.00*
Machine Shop Turnings	27.00-28.00
Short Shovel Turnings.	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	47.00-48.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast	40.00-42.00
Brake Shoes	44.00-45.00
Clean Auto Cast	46.00-48.00
Burnt Cast	38.00-39.00

Railroad Scrap

R.R. Malleable	55.00-57.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	51.00-53.00
Rails, 2 ft and under.	56.00-58.00
Uncut Tires	46.50-47.50
Angles, Splice Bars	55.00-56.00
Railroad Specialties	49.00-50.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos, electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	26.50
Rails, Random Lengths	26.50

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	*35.00-41.00*
Heavy Breakable Cast	*30.00-35.00*
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.00
Angles and Splice Bars	25.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	12.00
Punchings & Plate Scrap	35.50

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.50
Rails, Rerolling	39.50

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast.	45.00

* F.o.b. shipping point.

Be fair-We all must share

LOAD THEM HEAVY!

• • • SCRAP SHIPPERS EVERYWHERE CAN HELP THE ROLLING STOCK SHORTAGE BY LOADING HEAVY, THUS USING FEWER CARS AND MAKING MORE EQUIPMENT AVAILABLE

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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CLEVELAND, OHIO 1022 Midland Bldg.
LEBANON, PENNA. Luria Building
PUEBLO, COLORADO 334 Colorado Bldg.
BUFFALO, N. Y. Genesee Building
DETROIT, MICHIGAN 2011 Book Building
NEW YORK, N. Y. Woolworth Building
READING, PENNA. Luria Building
ST. LOUIS, MISSOURI 2110 Railway Exchange Bldg.
SAN FRANCISCO, CALIFORNIA Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Sheets, Strip . . .

Sheet and Strip Prices, Page 195-196

Boston—Defense priority orders are being issued against contracts placed before Oct. 3 in form of letters from military procurement offices. Priority ratings will be stamped on each new contract after Oct. 18.

New York—Producers of stainless sheets have booked various defense orders. Now that regulation No. 2 has been effected, they are asking these customers to obtain DO priorities so as to assure an early adequate supply of nickel. Sheet producers generally have not opened books for first quarter on major carbon grades, but anticipate considerable tonnage now scheduled for shipment will carry over.

Pittsburgh—Production schedules at most metalworking plants may be forced lower by inadequate steel supply in those plants not sharing in war contracts. Full production schedules among nonintegrated sheet and strip producers have been made possible only through acceptance of conversion tonnages supplied by customers. It is hoped tonnage of essential classifications will be distributed as equitably as possible among the various producers, and should not exceed 25 per cent of total output.

Wrought iron sheets were advanced by A. M. Byers Co. as follows: Black, from 12.00c to 12.60c per pound; galvanized, from 15.75c to 16.85c.

CHECK YOUR PRESENT NEEDS

High Alloy Castings

Baskets, Dipping ..... ☐	Crates, Annealing .... ☐	Retorts ..... ☐
Baskets, Quench ..... ☐	Dampers ..... ☐	Rolls ..... ☐
Belts, Heat Treating ... ☐	Fixtures, Furnace ..... ☐	Shafts ..... ☐
Boxes, Annealing ..... ☐	Muffles ..... ☐	Trays ..... ☐
Boxes, Carburizing .... ☐	Pipe,	Tubes, Combustion .... ☐
Chains,	Centrifugally Cast .. ☐	Tubes, Radiant Heat .. ☐
Furnace Conveyors .. ☐	Pots, Lead ..... ☐	Valves, Dampers ..... ☐
Containers,	Racks, Furnace ..... ☐	Fans,
Heat Treating ..... ☐	Rails, Furnace ..... ☐	High Temperature .. ☐

Special Castings ☐ (Send blue prints) Stainless Steel Castings ☐ (send data)

For over 30 years, Michiana has produced thousands of tons of Heat-Resistant and Stainless Steel Castings for a host of America's leading industrials. Some have been served continuously for a quarter century—good evidence of the long-life satisfactory performance.

If you will check your present needs and advise us, we will forward complete data, recommendations, and Bulletin III.

MICHIANA
Heat Resistant and Stainless Steel
ALLOY CASTINGS

MICHIANA PRODUCTS CORP.
Michigan City, Indiana

Write for Bulletin 111

Cleveland—Pressure for light, flat-rolled products is unabated. DO rated orders are increasing and the supply shortage is intensifying correspondingly. Producers are booked solidly into first quarter of next year. Much of last quarter output is going to care for third quarter overflow. Formal opening of first quarter books is being delayed pending clarification of the situation as regards priority rated tonnage. The mills are so oversold for fourth quarter the overflow will be sufficient to support high level operations well into first quarter.

Cincinnati—Sheet supplies are tightening as military needs continue to expand. Allocations for domestic requirements for the remainder of the year have been cut and may be reduced further if there is heavy impact from DO orders. Demand for stainless sheets, including those carrying voluntary priority tags, are in excess of production limits.

Chicago—Impact of defense orders is more pronounced. A recent order was booked for 2000 tons of cold-rolled for army huts. Cutbacks in civilian production are materializing. At least two refrigerator manufacturers have scaled back operations. Credit curb on house financing is expected to reduce demand for most major home appliances and for sheet metal work. Sheet users are bidding up to $400 for cold-rolled sheets in the gray market. Two metal furniture makers are reportedly entering into a deal with a midwestern hand mill for a share of its output. Prospects are being lined up in Detroit for a projected new cold mill in this district. Extremely tight zinc situation has forced one galvanized sheetmaker to discontinue production temporarily.

Birmingham—Civilian consumers are wondering just what DO business is going to do to sheet supply, already inadequate. There is slight prospect of any improvement in conditions.

Structural Shapes . . .

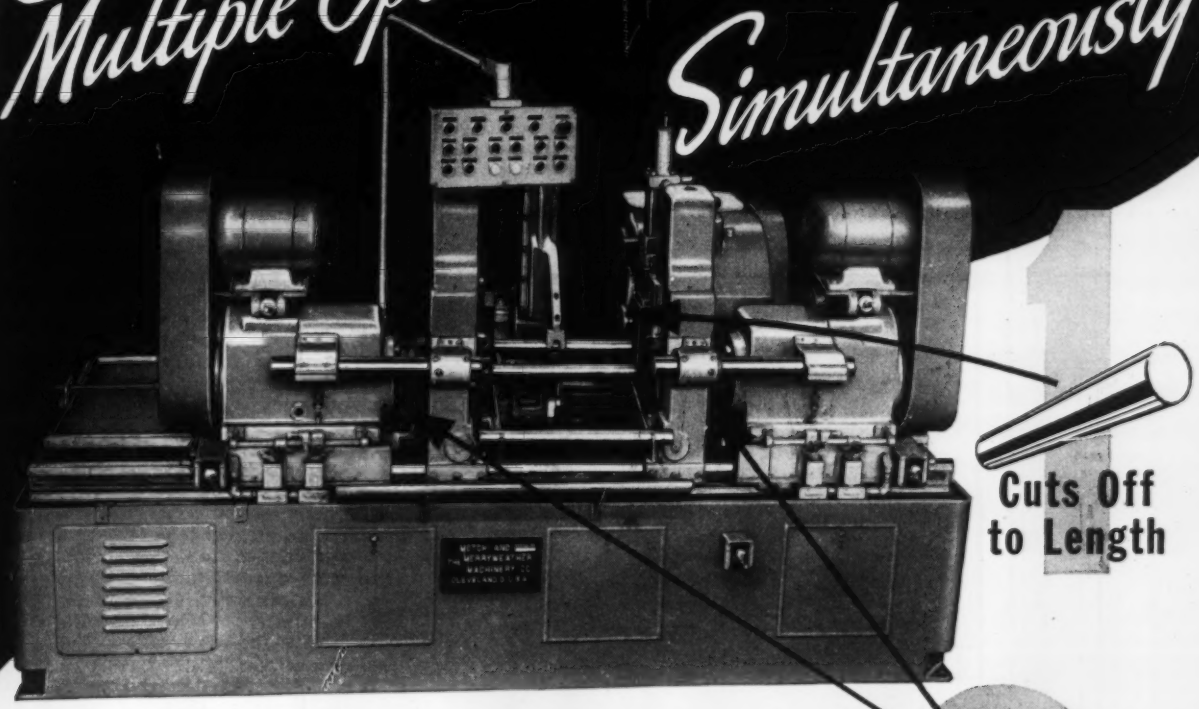
Structural Shape Prices, Page 195

Boston—In view of plain material cutbacks and low inventories, inability of fabricating shops to obtain fill-in requirements from warehouses is serious. Shops are reluctant to extend commitments. Larger units have backlogs up to seven months. New public work, schools excepted, is slightly slower.

New York—Structural inquiry is brisk, although extended delivery promises by fabricating shops are restricting business. Most fabricators are booked up at least six months. Private inquiry is more active than public demand.

Chicago—Users are relying more heavily on foreign shipments of structurals and plate. One important interest is awaiting first steel in a 12,000 ton purchase from Europe. Structural supply will contract considerably in the next two months as mills attempt to work off carryover and fit into their schedules semidefense requirements, still to great extent uncalculated. Diesel locomotive builders are casting around for new steel sources to permit production boosts. One would like to up output approximately 20 per cent.

UNITIZE *Multiple Operations!* CUT OFF TO LENGTH AND MACHINE BOTH ENDS — *Simultaneously*



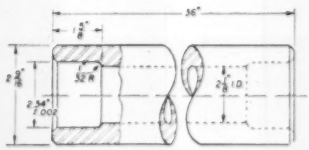
1 Cuts Off to Length

2 Machines Both Ends

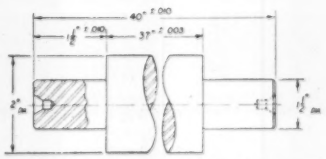
Capitalize on Motch & Merryweather's fast accurate circular sawing by combining it with simultaneous double-end machining operations. Save handling and floor space! Increase output and reduce cost! Unitize your production.

★ ★ ★

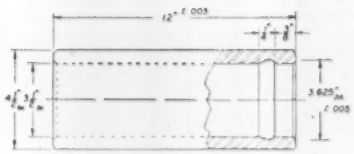
Write for further information.



Operation: Cut off; bore and chamfer inside and outside, both ends.
Material: SAE 1020 steel tubing.
Production: 140 pcs/hr. @ 100% eff.



Operation: Cut off; hollow mill and center drill both ends.
Material: C 1117 cold drawn steel.
Production: 84 pcs/hr. @ 100% eff.



Operation: Cut off; face and chamfer both ends; internal groove one end.
Material: C 1015 seamless steel tubing.
Production: 110 pcs/hr. @ 100% eff.

- Chamfers both ends • Center drills both ends • Center drills and chamfers both ends • Threads both ends
- Turns one or both ends (box tool)
- Chamfers O. D. and I. D. of tubing
- Reams one or both ends of tubing
- Chamfers O. D. and reams both ends of tubing • External grooves and chamfers one or both ends
- Internal grooves, faces and chamfers O. D. and I. D. one or both ends of tubing

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Big Plate Tonnage Imported

New York—Thirty thousand tons of plates from Holland recently arrived in the New York area, and an additional 10,000 tons are enroute to Galveston, Tex., for account of the Kane Pipe Corp., for fabrication into pipe for gas transmission lines. Additional shipments are expected at Galveston every eight to ten weeks.

The plates are brought in through William H. Muller & Co. Inc., New York, from the Royal Dutch plant at Ijmuiden, Holland.

Recent shipments are the first received in this country from the Ijmuiden plant, in operation since early this year. Annual plate capacity is 140,000 metric tons but beginning Jan. 1, 1951 capacity will be expanded to 200,000 metric tons. At present maximum widths of 92 in. are being brought into this country. The Royal Dutch plant is producing some sheets and is scheduled to get into production on bars, shapes, strip and tin plate soon.

William H. Muller & Co., agents for Royal Dutch, are no longer accepting new business in plates for shipment this year. Prices on past sales are said to have been comparable with the domestic market at delivered coastal points.

Harold J. Muckley, general manager, Kane Pipe Corp., recently returned to this country after a visit to the Ijmuiden plant. Earlier in the year 3500 tons of Royal Dutch plate were brought in to Mexico for the Manufactura de Tubos de Acero, S.A., Monterrey, subsidiary of the Kane Boiler Works, Galveston, Tex., for testing as to suitability for the fabrication of pipe. The Kane Boiler Works and the Kane Pipe Corp. are affiliated organizations.

Plates . . .

Plate Prices, Page 195

New York—Apart from emergency work, plate producers are accepting little new tonnage. Most are booked solidly over remainder of the year.

Philadelphia—Plate producers generally are restricting acceptance of DO priorities to regular customer, except in the case of government arsenals and other government plants, pending clarification of regulations. Requirements of the carbuilders have been fairly well lined up.

Chicago—Enforced curtailment of oil tank manufacturing because of the shortage of light plates has required several furnace makers to resume manufacture of coal-fired furnaces. Probability is new housing starts will be so severely curtailed by new loan regulations heating appliance manufacture will show a sharp reduction next year. Lack of hopper cars is imposing a ceiling on coal mine operation.

Birmingham—Demand for plates is cumulative. Miscellaneous users are asking for more tonnage, but record orders for freight cars has made the plate supply tighter than it was during the war.

Seattle—No major plate jobs are up for immediate action, although some tank work is pending.

Wire . . .

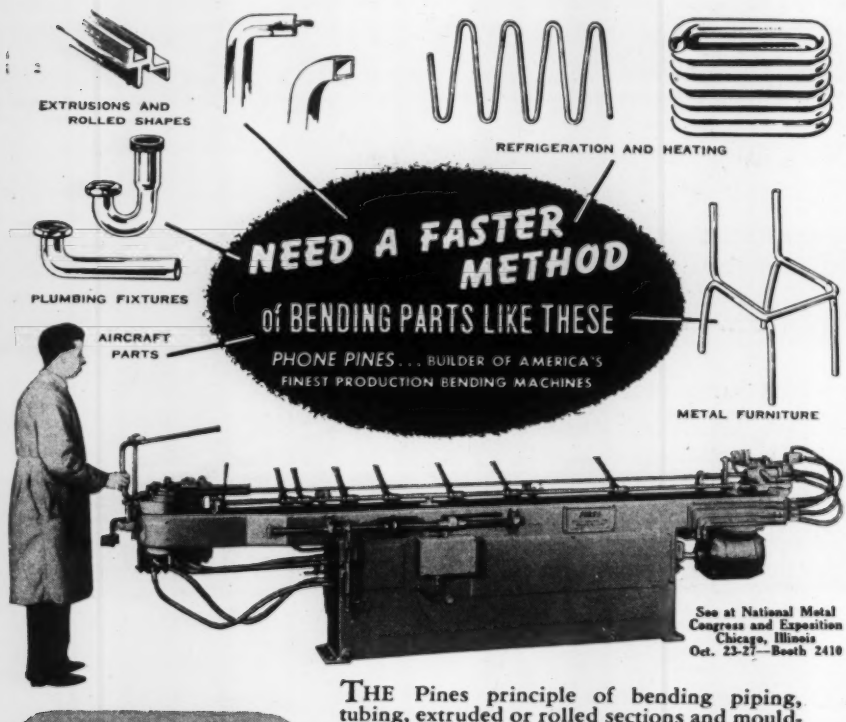
Wire Prices, Page 197

Boston—No letdown in demand for valve spring wire is apparent. One Worcester district producer has increased basic manufacturers' wire $5 per ton. Strong demand for wire rope is paced by a spurt in government buying including 2.5 million feet improved plow steel grade, Army Transportation Corps, Marietta, Pa.

New York—In addition to routine increases on galvanized wire products, minor adjustments upward in line with higher costs include some specialties.

Pittsburgh—Jobbers' inventories of merchant wire products, notably nails, are expected to remain out of balance and well below normal through remainder of this year. West Virginia Steel & Mfg. Co., Huntington, W. Va., advanced fence post price to column 125, effective Oct. 1, increase of $9 per ton.

Cleveland—Wire mills are pushing production to the limit of facilities but are unable to keep pace with demand. Order books are loaded with tonnage. Recent interruption of production at two local wire mills by wildcat strikes served to aggravate tight supply conditions. The tone of the market is strong but, except for galvanized products, prices are unchanged. Republic Steel Corp. last week effected a change in extras on galvanized wire items whereby prices are keyed to fluctuations in the price of zinc. Under the new sliding scale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galvanizing extras go up or down 5 cents per 100 pounds with each fluctuation of 2 cents a pound in the price of zinc. The new policy works much the same as the automatic adjustment of extras in the pricing of galvanized sheets in effect for some time past.

Crawfordsville, Ind. — Mid-States Steel & Wire Co., increased certain product prices Oct. 9 to the following levels: Galvanized merchant quality wire, 6 to 8 gage, $5.95 per 100 lb; woven fence, 9 to 15½ gage, column 123; bale ties, single loop, column 120; barbed wire, column 135; nails and staples, nonstock, $5.90 per 100 lb.

San Francisco—Large imports of nails have been received in San Francisco for distribution by importers. Shipments include 2557 kegs from Germany, 530 from Holland and 1700 from Japan. In addition 10,000 coils of German galvanized wire have been landed.

Steel Bars . . .

Bar Prices, Page 195

Boston—Carbon and alloy bar demand for armament tops that for most steel products and in some cases includes tonnage for which no established allocation exists; notably for Springfield and Watertown government shops. An additional 1180 tons, barrel blanks, Springfield, went to Republic Steel Corp., Cleveland, $256,318.50 and Bethlehem Steel Co., Bethlehem, Pa., $55,374.69. Carbon production schedules are being pushed back, orders extending into next year.

New York—Some DO inquiries are beginning to appear. Most to date apparently have been placed before regular suppliers. For the moment the mills are hesitating in making formal acceptance, pending clarification on some points in the No. 2 regulation; nevertheless, they are assuring manufacturers they will handle the tonnages. Undoubtedly, the DO orders will be worked in at expense of commercial business.

Philadelphia—Demand for alloy and cold-drawn bars is increasing rapidly under impact of defense requirements. Rated orders are pushing commercial orders back to such extent some cold-drawers are booked throughout first quarter. Cumberland Steel Co., Cumberland, Md., producer of ground shafting, has been down for two months because of a strike.

Pittsburgh—Jones & Laughlin Steel Corp. advanced cold-finished carbon bars $1 per ton to $4.15 per 100 pound base in line with level quoted by other interests, effective Oct. 10. Company advanced extras 25 cents per 100 lb for ground and polished, and 50 cents for turned, ground and polished.

Most cold-finishers are booked through first quarter, generally on basis of shipment "if and when possible." Some interests will not accept orders for delivery after the first of the year until their hot bar suppliers can give them a clearer promise on allotments. There is growing pessimism over effectiveness of NPA Reg. 2. In case of cold-finished bar customers it is contended the regulation does not assure adequate steel supply for builders of heat treating equipment, machine tools and cutting tools.

Furnace treatment extras for "electreat" rounds have been advanced 25 cents per 100 pounds; electreat squares, hexagons and flats are up 50 cents.

Cleveland—Bar buyers are meeting increasing difficulty covering their forward requirement with the mills sold out into first quarter. Increasing government orders carrying priority ratings are beginning to cut noticeably into supplies available to the regular market. Indications are the supply pinch will become really acute before yearend. Extent to which DO orders will cut into the separate mills' supplies is yet to be determined, but the industry task force is expected to develop an allocation program which will spread the government's needs equitably among the various producers. Cold-finished bar sellers are heavily committed but future shipments depend on their ability to obtain hot bar supplies.

Chicago—The one price increase made by Inland Steel a fortnight ago, on rail steel merchant bars, was justified by spiraling cost of rerolling rails. The district's rail steel barmakers have had to advance prices three times since July to keep abreast of raw materials costs. Rerolling rails cost approximately $12 a ton more than they did at that time. Some rerollers are specializing in conversion activity.

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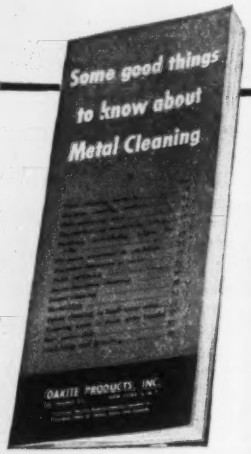

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Tin Plate . . .

Tin Plate Prices, Page 196

Pittsburgh—Revisions in tin plate pricing covering base prices and extras—are expected to be announced around Nov. 15 for 1951 shipments. The date will be advanced this year to enable can companies to work out details of their own can contracts on basis of the new mill pricing method to be put into effect by producers. (See STEEL, Oct. 9, p. 134.) Probability of higher tin plate prices for 1951 was given further impetus last week with rise in tin to record high of $1.125 per pound.

Refractories . . .

Refractories Prices, Page 199

Pittsburgh—Refractory brick producers advanced fire clay, ladle, malleable bung, silica and magnesite brick 10 per cent; basic brick, $5 per net ton. This price action was made to offset a 10-cents per hour wage increase retroactive to Oct. 1, higher freight rates, and other costs.

New price schedules on major refractory brick items follow:

Fire clay; super duty, $116.60 per 1000 bricks; high-heat duty, $94.60-$99.60; intermediate heat duty, $79.20-$88; low-heat duty $76-$79.20.

Ladle brick; dry press, $66; wire cut, $64.

Malleable bung brick, $94.60-$105.60.

Silica brick, $94.60-$111.10; eastern silica coke oven shapes, $92.40 net ton; western silica coke oven shapes, $93.50 net ton.

Basic brick is up $5 per net ton to $73 for burned chrome and $77 for chemical-bonded chrome; magnesite brick to $99 and chemical-bonded magnesite, $88. Domestic dead-burned magnesite in bulk is now quoted at $36.30, Chewelah, Wash.; $41.80 in single paper bags.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 198

Pittsburgh—Upward price adjustments recently established by nut and bolt interests brought quotations for hot-pressed items more in line with those for cold-punched. There was no across-the-board increase among the various items, since many were not advanced.

Cleveland—Prices on a number of bolt and nut items have been increased through reduction of discounts, but in the main the schedule of discounts remains as established about a year ago. However, indications are a general upward revision will be effected in event steel prices are advanced.

Warehouse . . .

Warehouse Prices, Page 199

Cincinnati—Deliveries of warehouse steel are down from the corresponding period last month because of low inventories.

San Francisco—Warehouses are besieged by inquiries, but stocks are low and new supplies limited.

Seattle—Warehouse steel business is smaller than it was in August,

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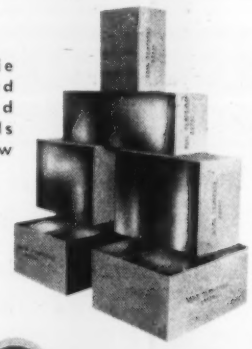

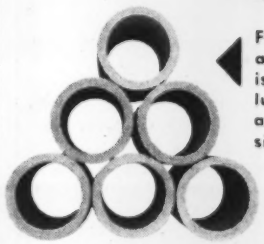

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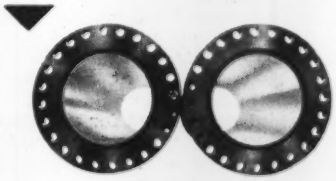

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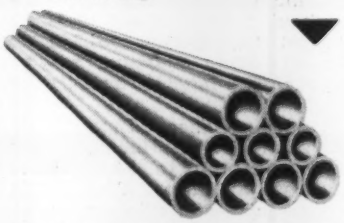

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when record bookings were made. This is due to the fact smaller shops have fair inventories and because wholesalers have broken and short inventories.

Iron Ore . . .

Iron Ore Prices, Page 199

Cleveland—Shipments of Lake Superior iron ore from upper lake ports are maintained at a high rate, amounting to 2,667,042 tons in the week ended Oct. 9. This brought the season's total to 61,957,656 tons compared with 67,920,048 tons for the like 1949 period.

Pig Iron . . .

Pig Iron Prices, Page 194

Boston — Foundry melt, slightly heavier, reflects improvement with basic area industries, machine tools, textile machinery, footwear, and paper. More pig iron consumers are building up inventories conservatively, and this, combined with better melt, has lowered reserves at Everett furnace.

New York—Consumers are pressing for more pig iron to sustain expanding operations. Foundries generally are operating at normal capacity. Domestic iron is scarce, but not sufficiently so to cause many to turn to foreign iron and pay the premiums involved. Furthermore, delivery promises are becoming more extended.

The Royal Dutch producer was scheduled to blow in one of its two stacks last week after having been down for major repairs. However, this producer is unable to accept new business for shipment before next quarter.

Iron imports to this country in the first seven months amounted to about 205,000 gross tons, well in excess of the corresponding period last year.

Philadelphia—The larger of two blast furnaces at Swedeland, Pa., which has been down since mid-September, is scheduled to go back into production this week. This will relieve the local stringency in pig iron to some extent.

Pittsburgh—Extent of increasing demand for railroad equipment castings is reflected in decision of Westinghouse Air Brake to start a third shift. Higher tempo of activity is noted among major foundry groups, with upward trend in production schedules restricted by scarcity of basic raw materials, particularly pig iron. Manpower shortage and narrowing profit margins are additional factors with which foundries must contend.

Carnegie-Illinois blew in its No. 2 furnace at Carrie Works on Oct. 8, making 44 out of 47 units active in this district.

Cleveland—Shortage of merchant iron is expected to increase under impact of rising military and related demands. Foundries are unable to augment inventories and are being forced to use more scrap in melts. Eight out of nine blast furnaces in this immediate district are in blast currently. One Republic Steel stack will be down for about 50 days for relining. This furnace suffered a breakout a week ago. Its suspension will not affect foundry iron supply since it was producing basic. Republic continues one of its stacks on foundry iron.

Cincinnati—Furnace agents are under heavy pressure for pig iron shipments while district allocations remain fairly constant. Supply is far short of demand.

Chicago—Foundries are pressing harder than ever for increased iron allotments but furnace operators are unable to divert greater tonnages to merchant use. Farm implement foundries are loaded with business, demand being intensified by strikes against some of the largest producers. District's level of blast furnace operation remains unchanged at 39 out of 42 stacks active. One is down for lack of coke.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 198

New York—Prices on oven foundry coke have advanced 75 cents to $22.75 Kearney, N. J., ovens, effective Oct. 10. Quotations advanced 80 cents at the Swedeland, Pa., ovens to $22.00, effective Oct. 11; 85 cents at the Philadelphia ovens, to $22.10, effective Oct. 9.

Buffalo—The leading producer of coke in this area raised prices $1.35

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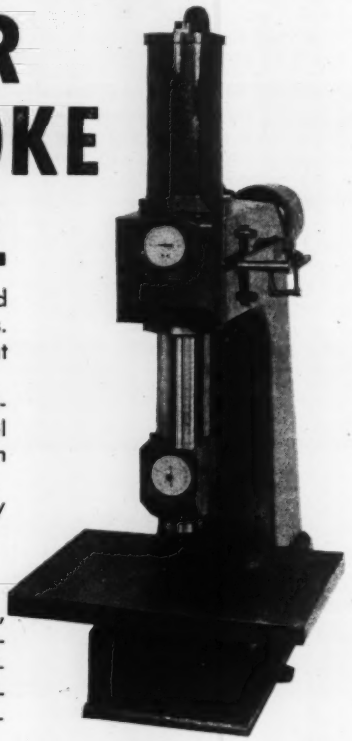

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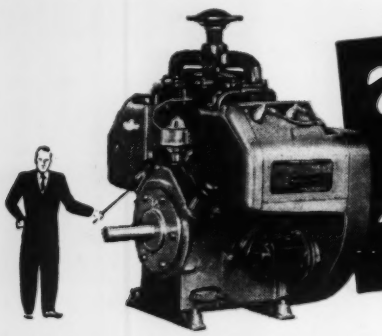

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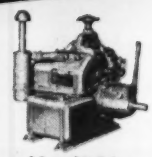

15 to 21.5 hp.

V VF-4

17.5 to 25 hp.

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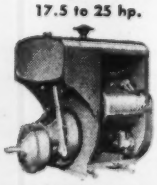

26.8 to 31 hp.

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a ton. The coke shortage remains critical as many consumers are forced to use inferior grades.

Cleveland — Oven foundry coke prices were advanced last week, the Erie, Pa., oven price rising $1.25 per ton to $22.50 and the Painesville, O., oven price $1.35 to $23.25.

Chicago — Higher oven foundry coke prices are being posted by nearby producers. The Indianapolis oven price was advanced $1.25 to $22 effective Oct. 9. The Terre Haute producer increased its oven price $1.30 to $22.50 on Oct. 13.

Los Angeles—Kaiser Steel Corp. is considering expansion of its Ironton, Utah blast furnace and coke ovens. Plans call for additional by-product coke ovens, open hearth furnaces, soaking pits, slabbing billets, and seamless tube mills.

Scrap . . .

Scrap Prices, Page 202

Pittsburgh — Mills maintain their comfortabe scrap stock position despite peak operations. Dealers are showing an inclination, however, to hold up shipments in anticipation of higher prices should current labor negotiations result in a substantial wage advance and, subsequently, higher steel prices. Some mills have notified suppliers that shipments on unfilled orders at prices well below current levels must be completed. While formula price levels hold on open-hearth grades, the growing pig iron shortage is exerting an upward pressure on prices for cast grades and rails which advanced $1 to $6 last week.

Boston—Slightly higher prices are paid for No. 2 heavy melting steel and turnings with No. 1 melting and bundles holding to formula quotations. Former grades and No. 1 busheling are 50 cents stronger. Cast grades are more active at firm prices.

New York—Brokers advanced buying prices on No. 2 bundles to $28-$28.50, f.o.b. shipping point; machine shop turnings and mixed borings and turnings, $24.50-$25; short shovel turnings, $25.50-$26. No. 1 cupola, No. 1 machinery, charging box and heavy breakable cast scrap prices are $1 higher. Unstripped motor blocks are higher at $30-$30.50.

Philadelphia—Strong pressure for No. 1 heavy melting steel continues but the formula price of $39, delivered, still rules. Two large eastern railroads indicate they will sell on this basis. Two conversion operators are paying more for melting steel, although purchases are in relatively modest volume, involving a special alloy-free low-copper grade.

Cleveland—Sales of No. 1 heavy melting steel were noted here up to $43.50, delivered consuming plant. Mills are paying springboard on factory material and this practice is expected to become general soon. Cast iron scrap prices are sharply higher. No. 1 cupola cast is $62-$63. Railroad scrap prices also are higher with the exception of No. 1 heavy which holds at $43-$44.

Cincinnati—Mills are holding closely to the formula in dealings for steelmaking scrap; strong demand for cast scrap, as foundries seek tonnage to offset shortage of pig iron,

First for
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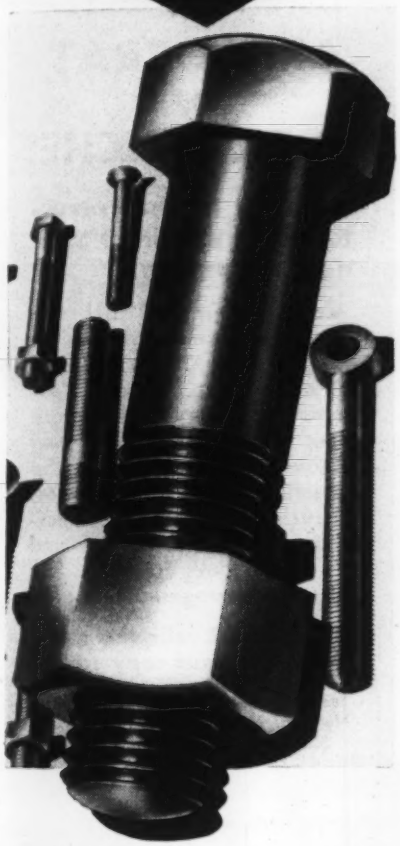
STUDS



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sent prices higher in these grades. Most mills hold satisfactory stocks, but foundries are avid for larger inventories. There is no evidence of upgrading to evade the formula.

Chicago—Although a purchase was made last week at formula prices for No. 1 heavy melting and bundles and for No. 2 heavy melting and bundles, mills have been unable to prevent breaks in the formula for other grades. Traders are selling low phos material for a minimum of $10 more than mills claim they will pay. This premium is the reason for No. 1 railroad heavy melting advancing far beyond the mill purchase price. The going market for No. 1 railroad heavy melting is $5-$6 higher than the mill price for allocated scrap. Cast scrap prices advanced sharply. Clean auto cast commands upwards of $56. Stove plate market zoomed upward to prevent material being funneled to a Michigan buyer who is offering $50.

Seattle—Bethlehem Pacific Coast Steel Corp. received 1200 tons of steel scrap from Honolulu by barge. A second barge with an equal tonnage was lost en route. First full cargo from Europe is expected daily for discharge here. Other shipments are coming from the Orient to relieve the local shortage.

While the market for No. 1 and No. 2 heavy melting is still $24, higher prices have been paid for some lots.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, municipal stadium, Milwaukee, to Milwaukee Bridge Co. and Worden-Allen Co., Milwaukee; bids on steel direct, Milwakee county park commission.

1700 tons, superstructure, channel span, bridge, Charles river, Boston, to American Bridge Co., Pittsburgh, $766,222.98.

1200 tons, laboratory building, American Cyanamid Co., Stamford, Conn., to Bethlehem Steel Co.

700 tons, power plant, Western Massachusetts Electric Co., West Springfield, Mass., to Bethlehem Steel Co.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

660 tons, state bridge, Berks county, Pennsylvania, to Bethlehem Steel Co.

650 tons, building, New England Deaconess Hospital, Boston, to American Bridge Co., Pittsburgh; Turner Construction Co., Boston, general contractor.

575 tons, coal handling plant, New England Power Co., Salem, Mass., to O. A. Wilson Structural Co., Cambridge, Mass.; W. T. Donovan Co., Boston, general contractor.

340 tons, 2-span continuous welded girder and one-span rolled beam bridges, Derby-Ansonia, Conn., to Electric Boat Co., Groton, Conn.; Mariani Construction Co., New Haven, general contractor.

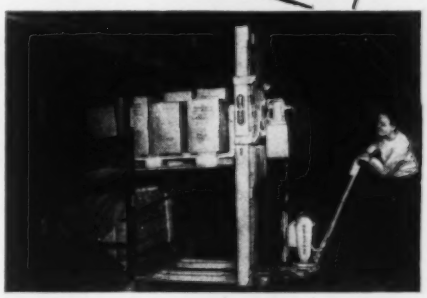
260 tons, rotary reconstruction and steel stringer bridge, Providence, R. I., to Bethlehem Steel Co.; Campanella & Cardi Co., Hillsgrove, R. I., general contractor.

250 tons, Pennsburg, Bucks county, Pennsylvania, to American Bridge Co., Pittsburgh.

235 tons, Astoria Federal Savings & Loan Association Bldg., 37-16 30th Ave., Long Island City, N. Y., to Grand Iron Works Inc., New York.

110 tons, 113-foot, 2-span continuous rolled beam bridge, Wallingford, Conn.; 75 tons of shapes to Bethlehem Steel Co. and 35 tons of bars to Truscon Steel Co., New York; Brunali Construction Co., Southington, Conn., general contractor.

There's a Rapid Trend to Palletizing
WITH
MOTO-TRUCS



One of several Moto-Truc Model "S" Motorized, Battery Operated Telescopic Hi-Lift Walkie Type Trucks handling open bottom pallets at Thompson Products Co., Cleveland.

● Palletizing with MOTO - TRUCS saves space and Labor.

Since turning to palletizing with Moto-Trucs, Thompson Products Co. has been able to use about 25,000 fewer square feet of floor area to do the same job of warehousing, and save labor.

A FEW EXCLUSIVE FEATURES OF THE MOTO-TRUC:

The overall length of Moto-Truc Telescopic Hi-Lift Trucks is from 18" to 20" shorter than other trucks of this type, due to more compact power unit, *enabling operation in narrower aisles.*

The controls, in easy grip roller type handle, reduce operator fatigue.

Powered by 12-volt motors for level operation and 18-volt for ramp operation.

Better traction is obtained by Patented Articulating Hinged Spring Unit which holds the drive wheel down on floor.

WRITE FOR BULLETIN NO. 50, and Specifications.

HI-LIFT TRUCKS, PALLET TRUCKS, PLATFORM TRUCKS, CRANE TRUCKS

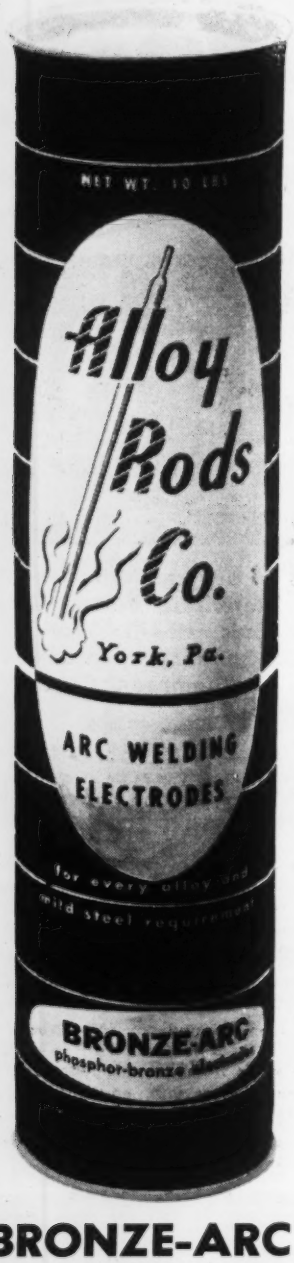
The MOTO-TRUC Co.
1943 E. 59th Street
CLEVELAND 3, OHIO.
Originators and world's largest exclusive manufacturers of motorized, battery operated walkie type trucks

The Quality Line

IN THE

STEEL CONTAINER

Moisture, dirt and grease proof . . .
Easy to stock convenient 10 lb. size.



BRONZE-ARC ARC WELDING ELECTRODES

BRONZE-ARC for ductile, high tensile welds on bronze, brass, copper, cast and malleable iron and steel. Smooth quiet easy-flowing arc in all positions. Deposits are free from porosity and surface pitting. Low spatter. Alloy Rods Company, 5610 W. Market St., York, Pa.

STRUCTURAL STEEL PENDING

1500 tons, municipal destructor plant, Manhattan, New York; Merritt-Chapman & Scott, that city, low on general contract.

900 tons, administration building, Nassau county, New York; Psaty & Furman, New York City, low on general contract.

900 tons, also penstock plates, 22,000-foot Eklutna power tunnel, Alaska; bids to Bureau of Reclamation, Denver, early 1951.

350 tons, Bullard-Havens school, Bridgeport, Conn.

660 tons, four-span through girder bridge, Garrison Dam; bids Oct. 31, Corps of Engineers, Bismarck, N. Dak.

575 tons, Washington state Skagit county truss bridge; bids to Olympia Oct. 24.

575 tons, leg extensions and specials, transmission line towers; bids to Bonneville Power Administration, Portland, Oreg., Oct. 19.

430 tons, state bridge, Delaware county, Pennsylvania; bids Oct. 27.

400 tons, high school, Falmouth, Mass.

360 tons, state bridge, Cumberland county, Pennsylvania; bids Nov. 10.

360 tons, state bridge on Pennsylvania-Reading-Seaboard rail route, New Jersey; bids Oct. 17.

330 tons, Harlem Welfare Center, a municipal project, New York; bids asked.

350 tons, Frances Schervier Home & Hospital, Bronx, New York; bids asked.

300 tons, Oregon state Jasper 751-foot bridge; general contract to Hamilton & Thomas, Eugene, Oreg., low $208,370.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, Washington state Cowlitz river bridge, to Poole, McGonigle & Dick, Portland, Oreg.; (project also involves 800 tons reinforcing bars and 500 tons steel piling) Peter Kewit & Sons, Longview, Wash., general contractors.

1000 tons, Miami Valley Hospital, Dayton, O., to Truscon Steel Co., Youngstown.

700 tons, apartment, Sheridan road, Chicago, to United States Steel Supply Co.

600 tons, housing project, Somerville, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; Calumet Construction Co., Boston, general contractor.

450 tons, parking garage, Sley System, Philadelphia, to American Engineering Co., that city.

300 tons, Queensborough apartments, Seattle, to Northwest Steel Rolling Mills Inc., Seattle.

250 tons, Washington state highway projects, to Northwest Steel Rolling Mills Inc., Seattle.

240 tons, paving, Westmoreland, Venango and Jefferson counties, Pa., to Bethlehem Steel Co.

229 tons, Rieck-McJunkin Dairy Co., Pittsburgh, to United States Steel Supply Co.

200 tons, library, Northeastern University, Boston, to Concrete Steel Co., Boston; Sawyer Construction Co., Boston, general contractor.

200 tons, grain elevators, eastern Washington, to Bethlehem Pacific Coast Steel Corp., Seattle.

175 tons, Union Carbide & Carbon Corp., Sterling, Ill., to United States Steel Supply Co.

REINFORCING BARS PENDING

4000 tons, Appalachian Electric & Power Co., Glasgow, W. Va.; bids asked.

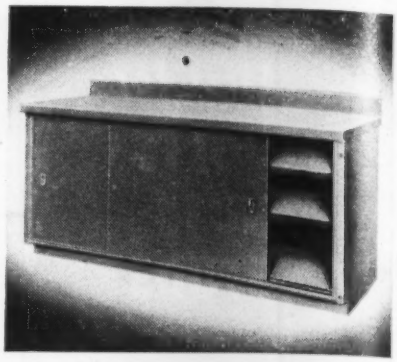
1500 tons, United Biscuit Co., Chicago; bids asked.

1400 tons, Wabash river power house, Terre Haute, Ind.; bids asked.

1225 tons, Eklutna power project, Seattle; bids to Bureau of Reclamation, Denver, early 1951.

750 tons, warehouse, Penn Fruit Co., Philadelphia; bids closed. Tonnage is in addition to 1000 tons of shapes recently noted as placed with Bethlehem Steel Co.

700 tons, Chicago Housing Authority Site No. 9, Chicago; bids asked.



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. . . built for men accustomed to the finest tools and equipment.

We "pulled out all the stops" when we designed the HALLOWELL Cabinet Bench, giving it more "custom" features than any other stock bench we know of. All-steel construction, choice of top materials, ample storage space, standardized units, interchangeable accessories, and trim good looks are just a few of its advantages.

Bulletin 702 tells the story. Write for your copy today!

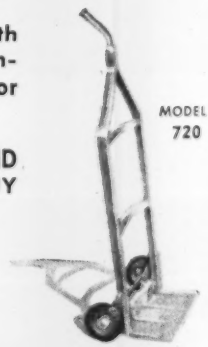
See us at Booth 2434, Convention of National Metal Congress and Exposition, Chicago, Oct. 23 to 27.

NEW!

HALLOWELL "UNI-TRUK" HAND TRUCKS

Available with one or two handles . . . send for Form 757-1.

"TRY ONE AND YOU WILL BUY MORE"!



PAT. APPLIED FOR

HALLOWELL

SHOP EQUIPMENT OF STEEL
OVER 47 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN 33, PENNSYLVANIA

300 tons, Calumet intercepting sewer, cont. 18F, Blue Island, Ill.; bids asked.

218 tons, hospital, Oak Park, Ill.; bids asked.

200 tons, Calumet intercepting sewer, cont. 18C, Blue Island, Ill.; bids asked.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Baltimore & Ohio, 90 diesel-electric locomotives, to be leased from Equitable Life Assurance Society; units will be built by Electro-Motive Division, General Motors Corp., La Grange, Ill., and will comprise eighty-six 1500-hp freight and four 2200-hp passenger units.

Canadian National, eight 1600-hp diesel-electric road units, to Montreal Locomotive Works, Montreal.

LOCOMOTIVES PENDING

Louisville & Nashville, 26 diesel-electric locomotives, contemplated; twenty-two will be of 1500-hp and four of 2250-hp.

RAILROAD CARS PLACED

Akron, Canton & Youngstown, 50 seventy-ton covered hopper cars, to Greenville Steel Car Co., Greenville, Pa.

Canadian National, 5000 fifty-ton box cars, including 2000 to the Canadian Car & Foundry Co., Montreal, and 1500 each to the National Steel Car Corp., Hamilton, Ont., and to Eastern Car Co. Ltd., Trenton, N. S.

Denver & Rio Grande Western, 575 freight cars; 500 triple hopper cars to Pressed Steel Car Co., Chicago, 50 flat cars to its own shops in Denver and 25 covered hopper cars to the American Car & Foundry Co., New York.

Minneapolis, St. Paul & Sault Ste. Marie, 400 box cars and 100 twin hopper gondolas to its own shops at North Fond Du Lac, Wis.

RAILROAD CARS PENDING

Chicago, Burlington & Quincy, 2200 freight cars; contemplated. Equipment will include 1000 box cars, 400 flat cars, 350 refrigerator cars, 250 gondola cars and 200 hopper cars.

Colorado & Southern, 250 box cars; contemplated.

Fort Worth & Denver City, 250 box cars; purchase authorized.

RAILS PENDING

Chicago, Burlington & Quincy, 50,000 tons, plus fittings; purchase authorized.

Colorado & Southern, 4000 tons of rail and fittings; purchase authorized.

Fort Worth & Denver City, 1600 tons of rail and fittings; purchase authorized.

Louisville & Nashville, 64,000 tons; bids asked.

FERROALLOYS

(*Continued from page* 199)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8 MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

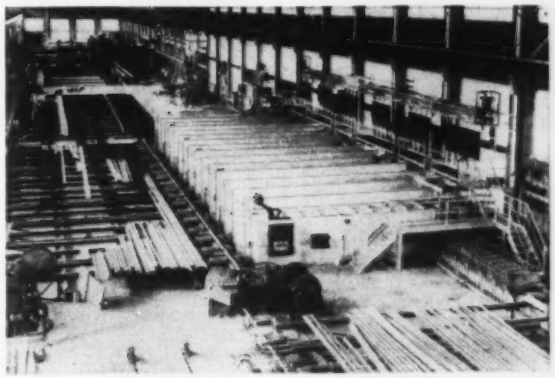
Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50%

for
HOMOGENIZING
SOLUTION TREATING
AGING
BILLET HEATING
BRAZING
FINISH ANNEALING
OR ANY OTHER PROCESS

There's an **EF** furnace to handle any product or production



Completely Automatic EF Furnace Heats and Quenches Aluminum Shapes up to 90 Feet Long.

● Our wide experience in the processing of aluminum, magnesium and other non-ferrous and ferrous products can save you time and money. We build continuous and batch type furnaces,— gas fired, oil fired or electric . . . whichever is best for your particular requirement — furnished complete with all necessary charging, discharging, quenching, special atmosphere and special handling facilities. For long, efficient, trouble-free service, let EF engineers work with you on your next furnace problem.

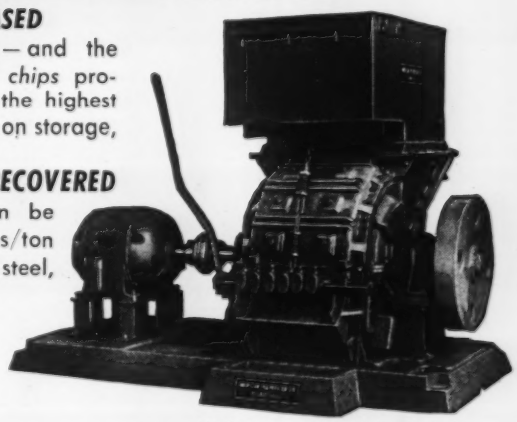
Gas-Fired, Oil-Fired EF and Electric Furnaces
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
WILSON ST. at PENNA. R. R. Salem - Ohio

One of five American #3800 Crushers used to process 28,198 tons of metal turnings last year at the Canton, O. plant of The Timken Roller Bearing Company.

TIMKEN gets the most out of scrap
. . . with AMERICAN METAL TURNINGS CRUSHERS

1. SCRAP VALUE INCREASED
Scrap prices are climbing — and the more uniform *short shovel chips* produced by Americans bring the highest scrap prices . . . save money on storage, handling.

2. MORE CUTTING OIL RECOVERED
Cutting oil reclamation can be increased to 30-50 gallons/ton when long, curly turnings of steel, alloys, brass, aluminum etc. are American-reduced and washed.



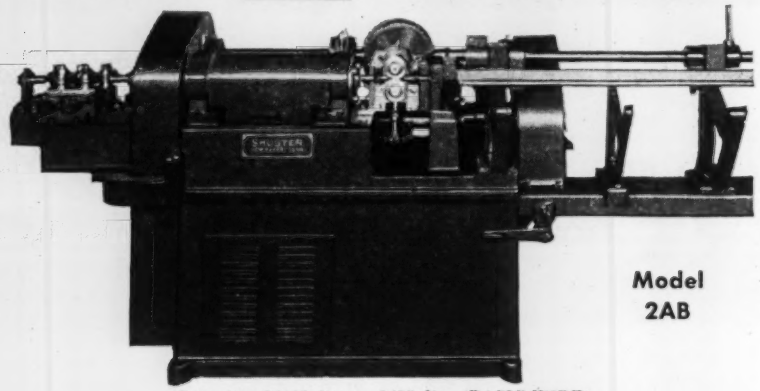
Write for complete details

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1539 MACKLIND AVE.
ST. LOUIS 10, MO.

This New, Economical

SHUSTER

Cuts Costs AND Accurate Lengths!



Model 2AB

Capacity: 3/16" dia. — 3/8" dia. (BASIC WIRE)

Automatic

WIRE STRAIGHTENING AND CUTTING MACHINE

This new "SHUSTER"—with its five gear-driven straightening rolls—handles even badly twisted wire with ease. Square and rectangular as well as round wire may be straightened and cut to exact lengths. Other "Shuster" features that assure high speed, quality production are: almost continuous wire travel, rapid cut-off, V-belt motor drive, ball and roller bearings, and extreme rigidity throughout. .025" to 11/16" diameters. Write for details.

Mfd. by METTLER MACHINE TOOL, INC.

132R Lawrence St. **New Haven, Conn.**

Representatives in all principal cities and foreign countries.

Since 1887

MILWAUKEE WROT WASHERS

Better WASHERS ... Competitively Priced

Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blueprints and quantity requirements for estimates.*

WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

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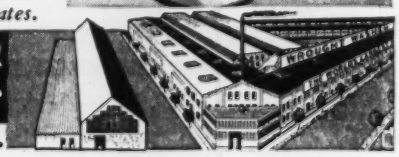


C Grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.65c per lb of alloy, ton lots packed 10.05c, 200 to 1999 lb 10.40c, smaller lots 10.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lot 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.04 per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

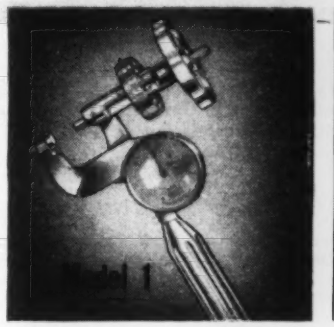
Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

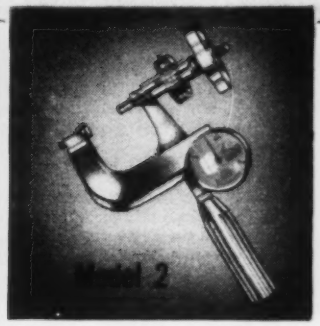
Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ames Precision HARDNESS TESTERS
FOR ROCKWELL HARDNESS TESTING

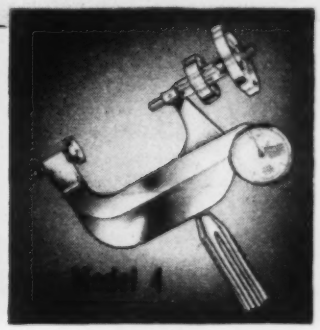
Today, hardness testing is coming into universal use as a necessity in the working and fabricating of metals. With Ames Testers, readings are made accurately, quickly, on-the-spot, directly in the Rockwell Hardness Scales.



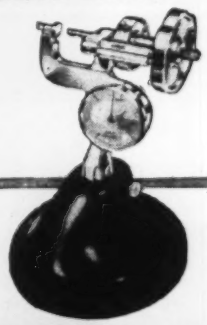
For testing round and flat stock, tubing, saws, knives, etc., up to one inch in Rockwell A, B and C Scales. Weighs only 1½ lbs.



For testing rounds and flats, dies, odd-shaped pieces, etc., up to two inches in Rockwell A, B and C Scales. Weighs 2½ lbs.



For testing up to four inch capacity directly in Rockwell A, B and C Scales. Throat depth two inches. Weighs 3¼ lbs.



Cast Iron Bench Stand permits use of both hands when testing small parts. Tester is inclined at convenient angle and is firmly clamped in stand

Box for Tester and Accessories Equipment includes diamond and 1/16" ball penetrators, two anvils, two steel test blocks, one brass test block and Rockwell Conversion Chart.

AMES PRECISION MACHINE WORKS
WALTHAM 54, MASS.

BLAST FURNACE CONSTRUCTION
Rebuilds & Linings—also Construction, Maintenance & Repair of
INDUSTRIAL FURNACES & BOILERS
Complete Facilities: Design, Engineering, Materials
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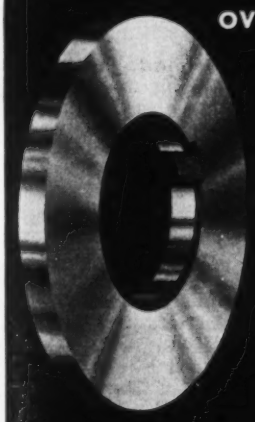
An Affiliate of CHEMSTEEL CONSTRUCTION CO., INC.

COWLES
GANG SLITTING KNIVES
OVER 30 YEARS EXPERIENCE

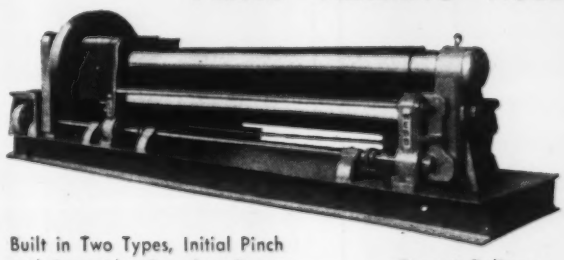


Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*

COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

DESIGNED and BUILT TO DO THE JOB

THE WEBB PLATE BENDING ROLL



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Prompt Delivery on Standard Sizes

Webb Plate Bending Rolls are designed and built for the forming of cylindrical shapes from rolled steel plate with greater speed and accuracy for high quality production.

All Webb Rolls are backed by continuous progress in the development of industrial machinery since 1881.

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MANUFACTURERS OF PLATE ROLLS, COMBINATION PUNCH & SHEARS
Industrial Weighing Equipment

Since 1881

THE **WEBB** CORP.
WEBB CITY, MO.

SAVE

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Special equipment and volume production enable us to save for you on a wide variety of precision metal parts.

For example, special shafts and pivots are made to order for meters, instruments, speedometers, tachometers, etc. Sharp, concentric, ground or swaged single or double points. Diameters .015" to 5/16". Lengths 3/16" to 10".

We are also set up to make such parts as special needles, rollers, shafts, studs, dowel pins, surgical and dental instruments, pen and pencil barrels, knurled mandrels and spindles, screw driver and ice pick blades, etc.

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Makers of
TORRINGTON NEEDLE BEARINGS

Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

California

Ford Motor Co. plans a $1 million modernization program at its assembly plant in Richmond, Calif. Blueprints for the expansion are being drawn and work is expected to start in January. The program's goal is an increase in production to about 500 units daily from 350 cars a day now being turned out at the plant.

California

McCabe-Powers Auto Body Co. purchased the Oakland, Calif., plant of American Coach & Body Co. and plans to expand manufacture of ladder, hydraulic tower, winch and truck bodies.

Connecticut

Pitney-Bowes Inc., Stamford, Conn., started a building program to cost $250,000. The company just completed a $1 million expansion program.

Delaware

Wilkes-Barre Steel Corp., steel, was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $100,000. United States Corporation Co., Dover, Del., is serving as the principal office.

Delaware

ESB International Corp. — batteries and electrical machinery — filed a charter of incorporation with the secretary of state's office, Dover, Del. Capital of the firm is listed at $3 million. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Massachusetts

Holyoke Wire & Cable Co., Holyoke, Mass., plans an expansion program involving $70,000 for more space and equipment.

Michigan

Globe Products Corp. (formerly Globe Sales & Engineering Co.) moved to its new office and plant at 1818 Bassett Ave., Lansing 15, Mich.

Mississippi

Anemostat Corp. of America, New York,—air diffusers—appointed Robert Porter, 515 Yazoo St., Jackson, Miss., as representative for southern Mississippi.

New Jersey

Franklin Iron & Metal Co., Newark, N. J., changed its name to Franklin Metals Co. The firm deals in aluminum, brass, copper, zinc and other nonferrous scrap.

New York

Pyroferric Co., New York, acquired a manufacturing plant at 14 N. Bleeker St., Mt. Vernon, N. Y. These facilities will be used to augment the company's output of powdered metal iron cores, also produced at its main plant in New York city.

New York

Federal Government awarded a $3 million contract for rehabilitation of the former **Bell Aircraft Corp.** plant in Buffalo. The building will be used for the storage of critical supplies.

New Jersey

Charles Bruning Co. Inc., New York, manufacturer of blueprint and whiteprint papers and machines, drafting equipment and technical photographic products, will erect a $1 million plant at Bergen County Industrial Terminal, Teterboro, N. J. Alexander Summer Inc., Newark, N. J., has designed the building, accepted bids and awarded the contracts.

New York

B. F. Goodrich Chemical Co., Cleveland, moved its New York sales office into larger quarters in the Farmers Loan & Trust Co. Bldg., New York.

New York

Hauser Machine Tool Corp., Manhasset, N. Y., was appointed representative for Leo Hjort Co., Copenhagen, Denmark, manufacturer of keyless, self-centering drill chucks.

New York

Ground was broken for a $2.5 million electric melting building at **Allegheny Ludlum Steel Corp.'s** plant at Watervliet, N. Y. The job is scheduled for completion in seven to eight months.

Ohio

Aro Equipment Corp., Bryan, O., purchased the business and assets of Taylor Machine Co., Cleveland, which includes plants at 2047 E. 77th St. and 1917 E. 61st St. These will be known hereafter as the Aircraft Division of Aro Equipment Corp. Taylor Machine made a variety of gears, and at present is working on government contracts. James P. Johnson was named vice president and will have charge of the Cleveland aircraft division. A. N. Abelson will be works manager.

Ohio

M. A. Harrison Mfg. Co., Route 113, near Florence, O., is enlarging its shop. The company machines bronze bearings and also does custom work.

Ohio

Minnesota Mining & Mfg. Co., St. Paul, is constructing a $250,000 branch warehouse, distribution center and office building on Elmwood avenue, Cleveland. The building is scheduled for completion early in 1951.

Ohio

Royal Vacuum Cleaner Co., 540 E. 105th St., Cleveland, is equipping the factory building at the southeast corner of St. Clair and E. 51st St. as a machine shop for the Z & W Machine Products Co., prospective buyer, now located at 5151 St. Clair Ave.

Ohio

Lakeside Steel Improvement Co., Cleveland, specializing in scientific commercial steel treating, is installing new equipment at a cost of $50,000 to facilitate advanced methods in processing of steel. The company's plant is at 5418-20 Lakeside Ave.

Ohio

Arrangements for additional distribution of Nelson stud welded fasteners through four national manufacturers and distributors of construction materials and one regional firm were announced by Leonard C. Barr, vice president of **Morton Gregory Corp.,** Lorain, O. Mr. Barr is sales manager of the Nelson Stud Welding Division. The five distribu-

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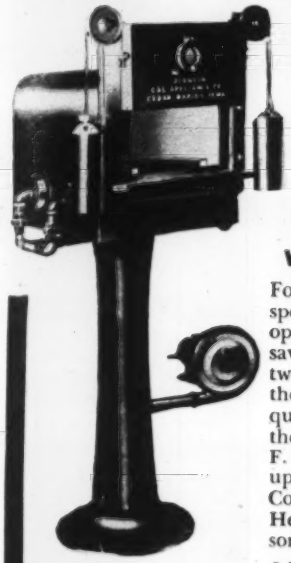
Quick Acting JOHNSON FURNACES



Turn the Heat On High Speed Steels with Johnson No. 130A

For low cost heat treating high speed steels, dies, tools. Reaches operating temperature fast to save time and gas. Available in two temperature ranges. Use the 4-Burner unit for steels requiring 1400 — 2350° F. and the 6-Burner for 1800 — 2400° F. Counterbalanced door opens upwards. Firebox 7 x 13 x 16½. Complete with Carbofrax Hearth, G. E. Motor and Johnson Blower.

4-Burner **$295.00**
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F. O. B. Factory

Johnson No. 1019 For Heavy Duty Soft-Metal Melting

Efficient, economical. For melting large quantities of lead, tin, zinc, pot metal, type metal, aluminum, etc. Nine powerful JOHNSON direct jet burners deliver pot temperatures up to 1400° F. for fast melting. Assure quick recovery after reloading. Separate shut-offs permit use of only as many burners as needed to maintain melting temperature. Heavily insulated to reduce heat loss. Complete with removable cast iron pot and lifting hooks. Capacity: 1000 lbs. lead.

No. 1019 . . . . . **$312.00 F.O.B. Factory**

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HEAT TREATING, POT HARDENING & MELTING FURNACES
BURNERS • TORCHES • BLOWERS • MIXERS • VALVES

Versatility counts in
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Excellent facilities for pickling and oiling

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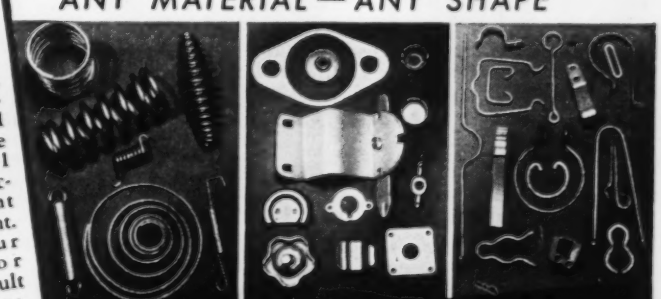
Parts like these are made to your specifications. When desired, spot welding, tapping and small assemblies can be provided. All tools and production equipment made in our plant. Send us your drawings or samples. Consult us on applications.

ANY MATERIAL — ANY SHAPE



M. D. Hubbard Spring Company
405 Central Avenue • Pontiac, Mich.